

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

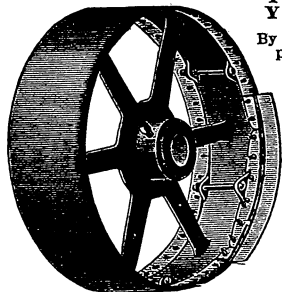
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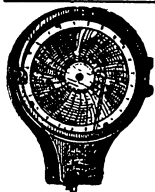
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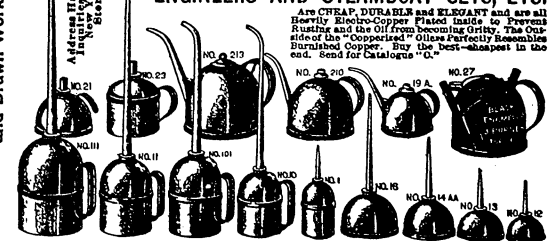


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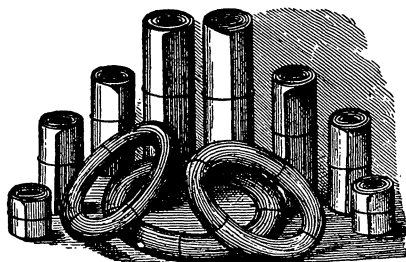
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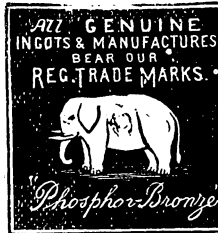
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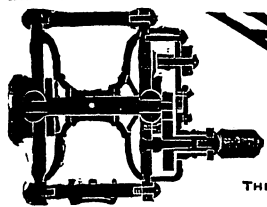
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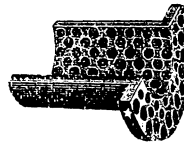


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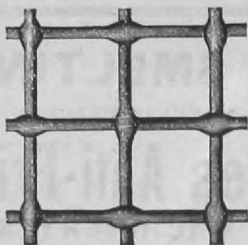
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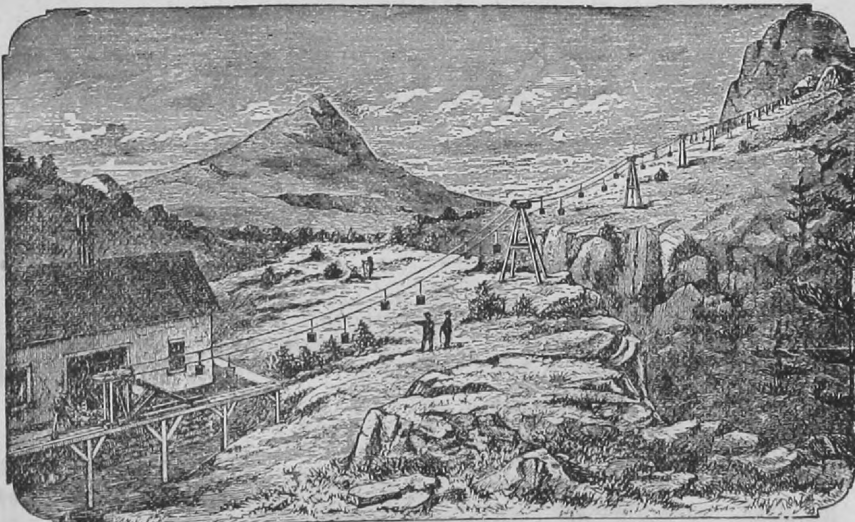
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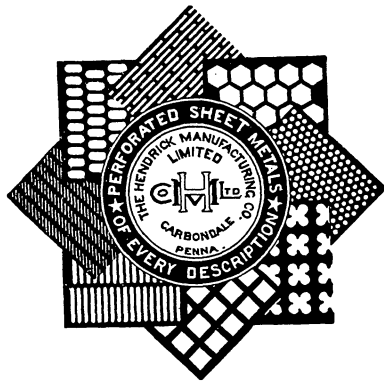
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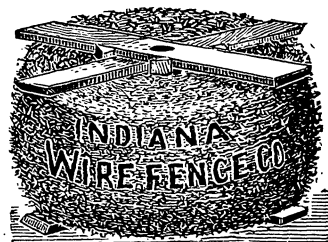
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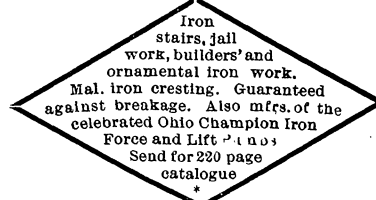
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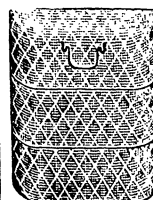
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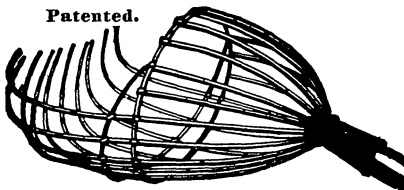


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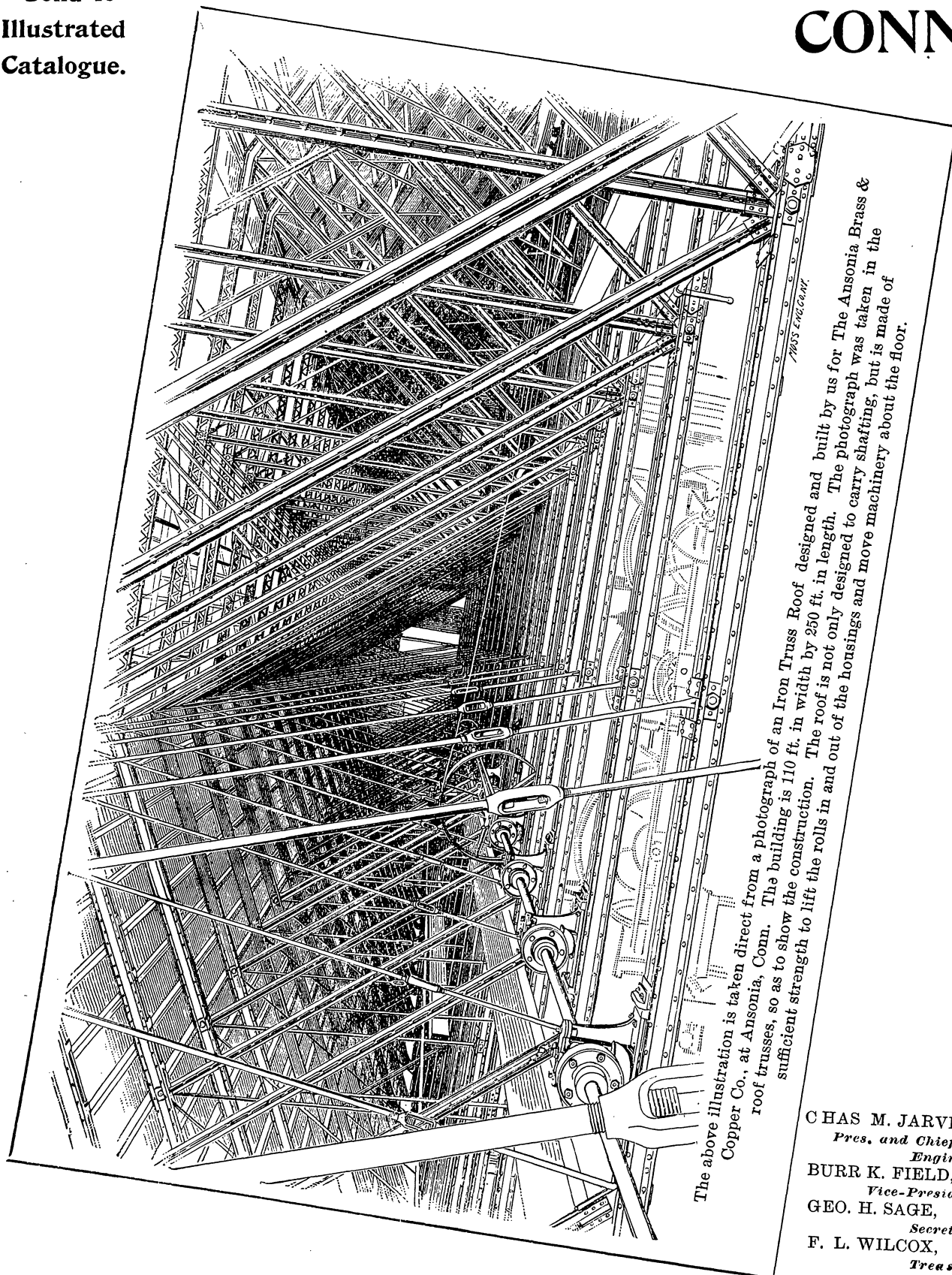
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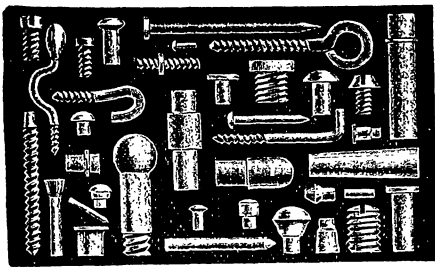
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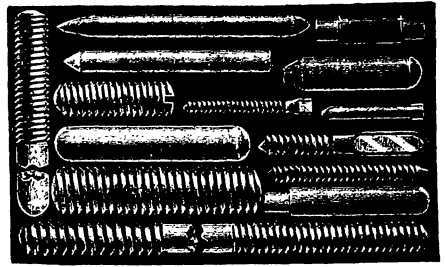


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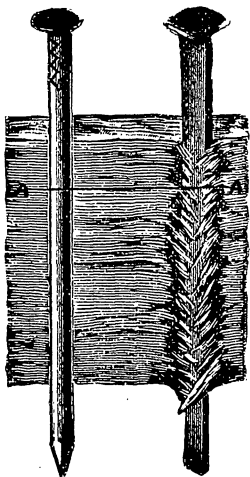
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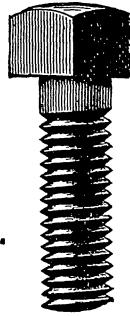
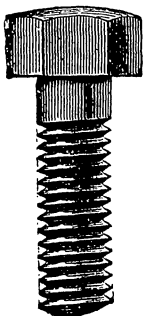
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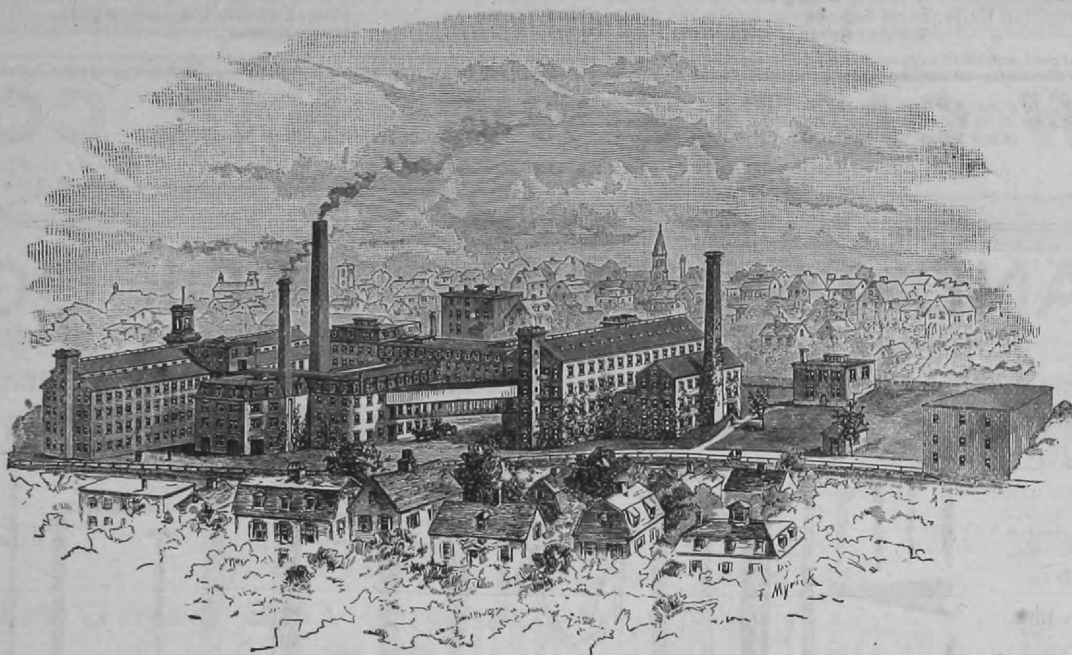
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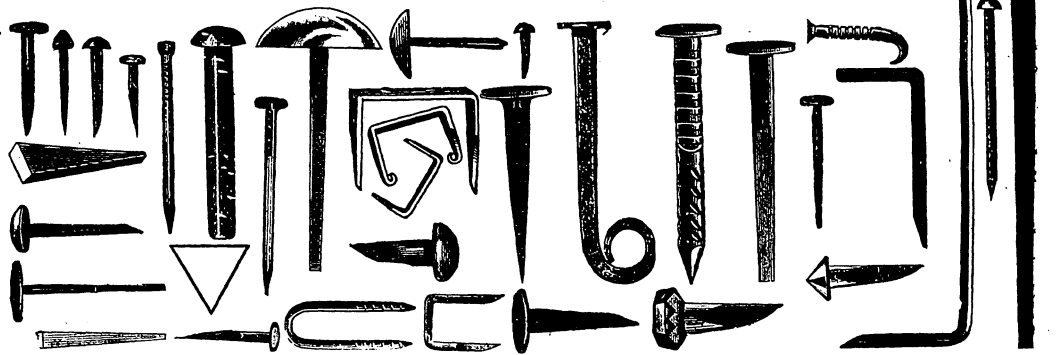
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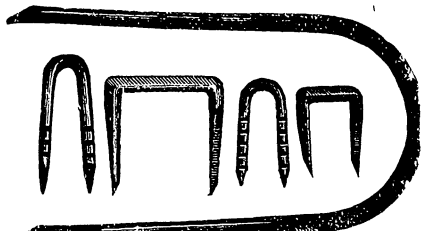
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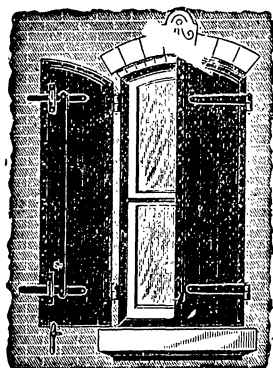
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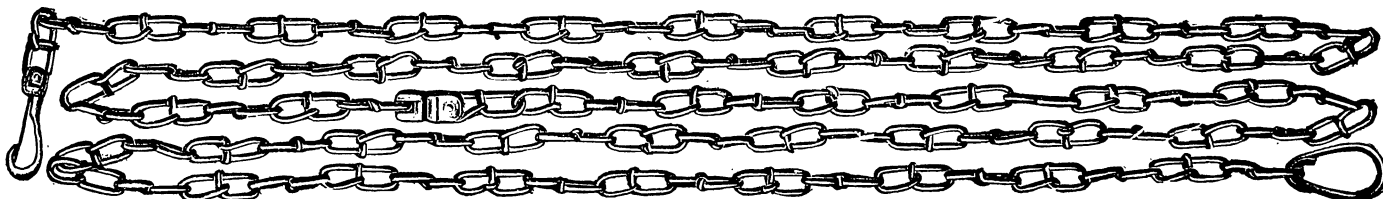
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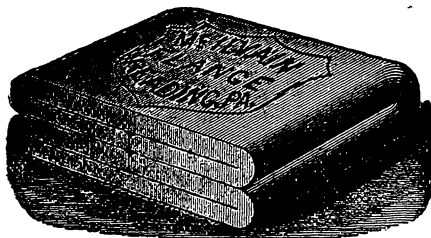
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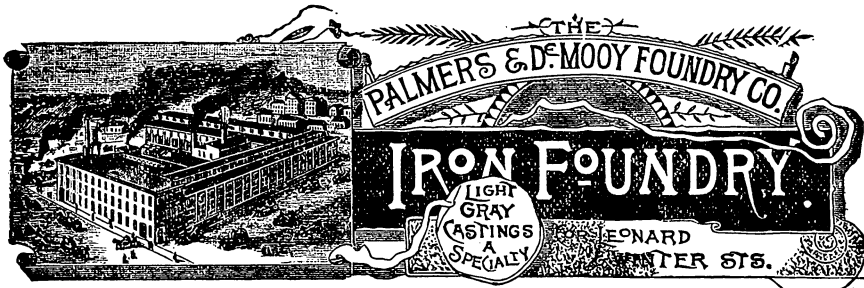
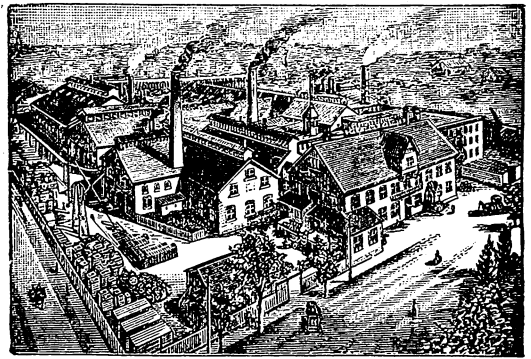
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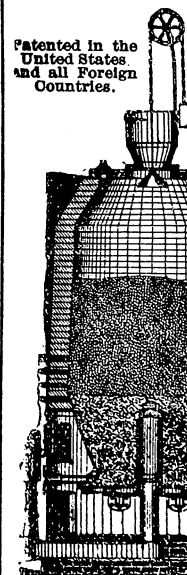
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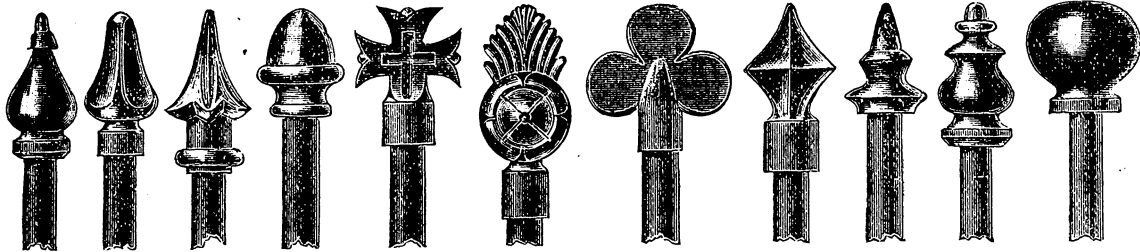


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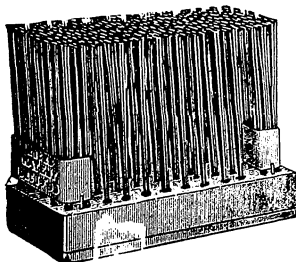
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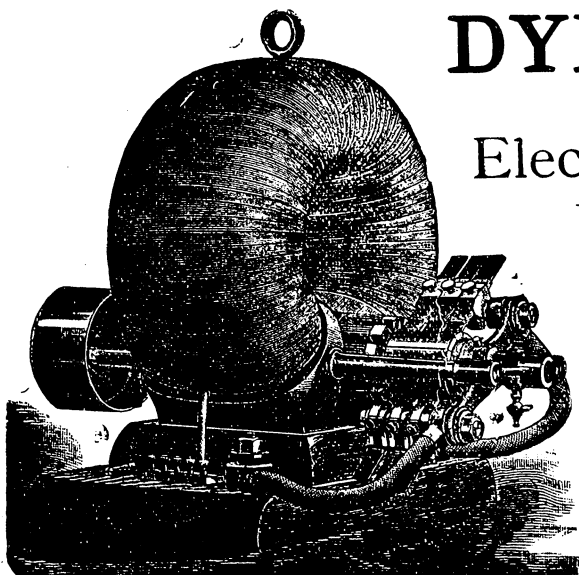
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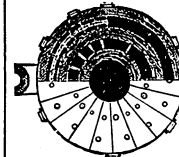
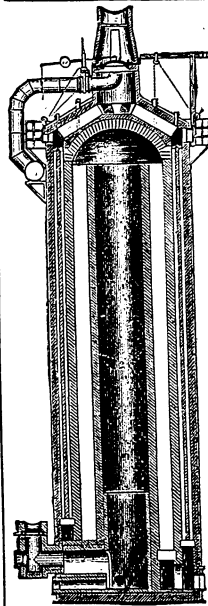
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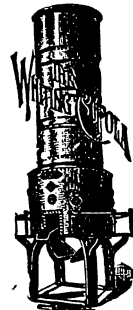
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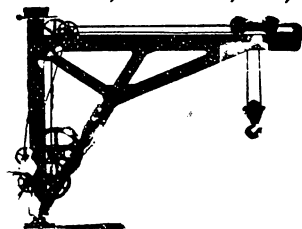
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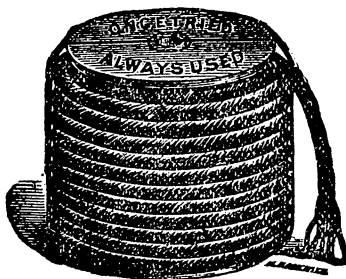
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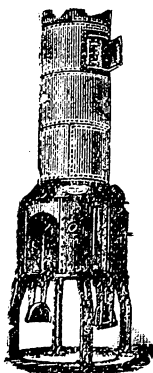
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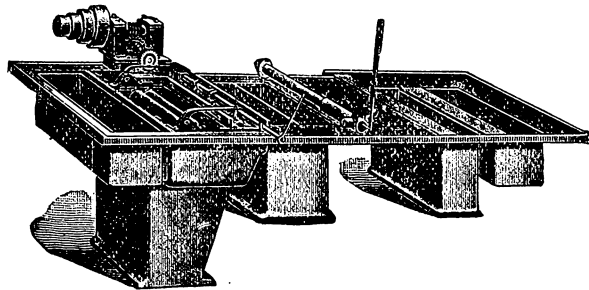
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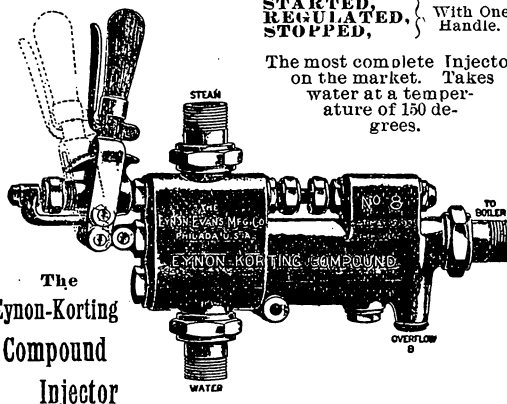
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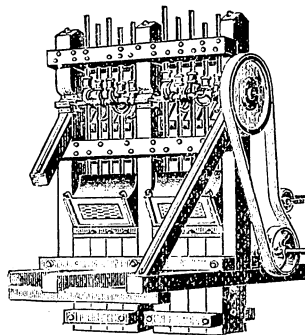
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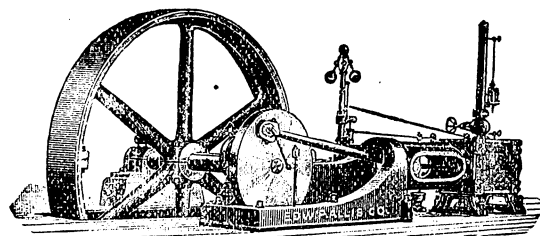
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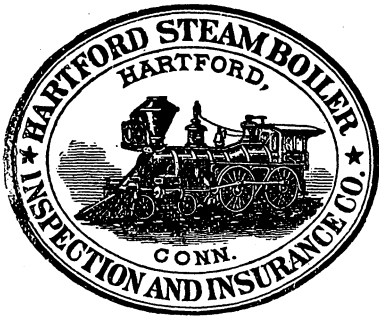
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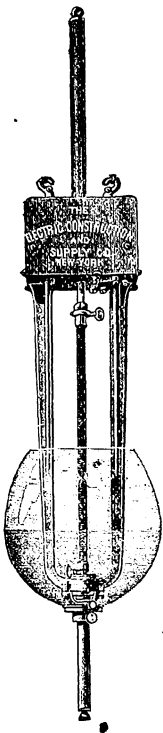
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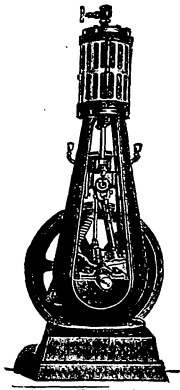


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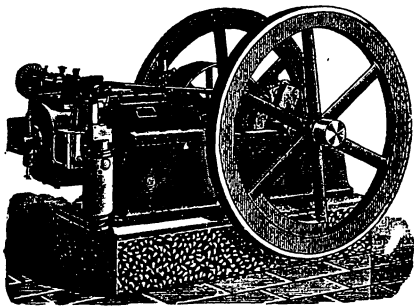
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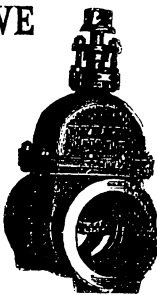
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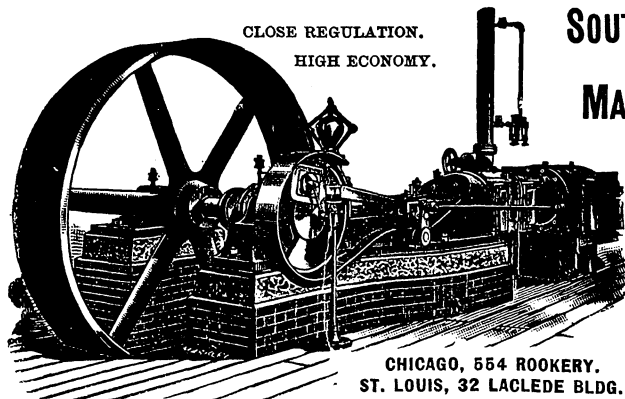
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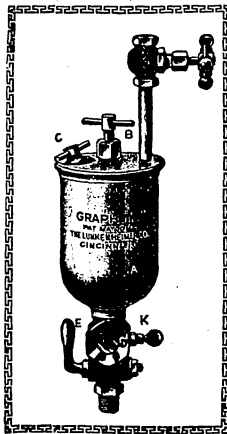
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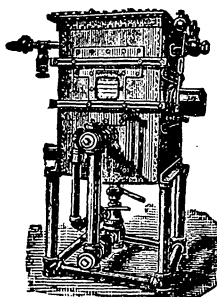
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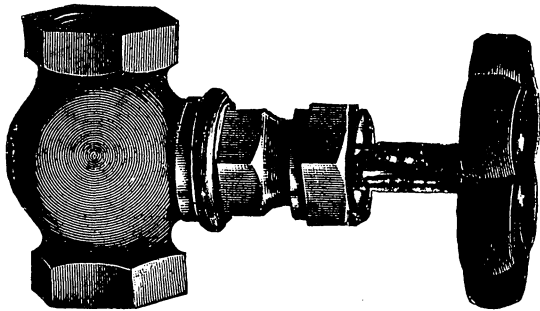
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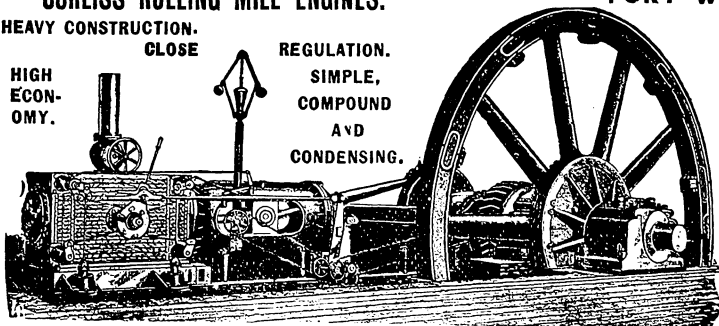
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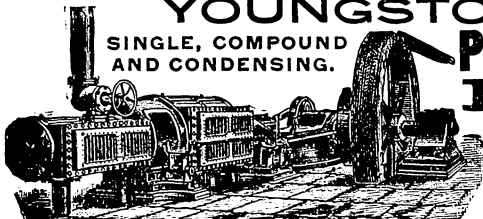
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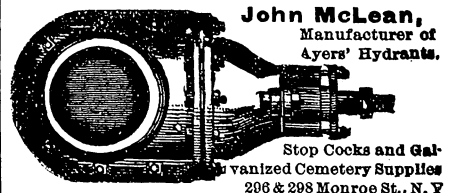
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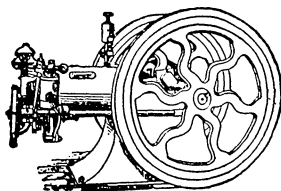


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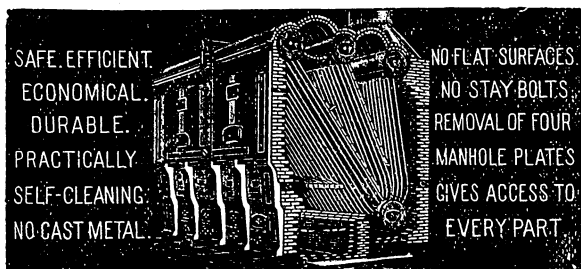
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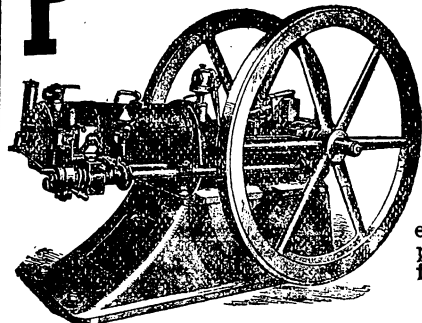


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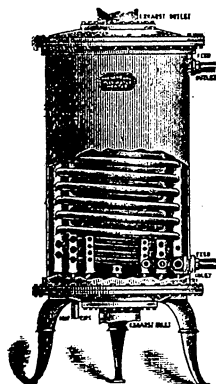
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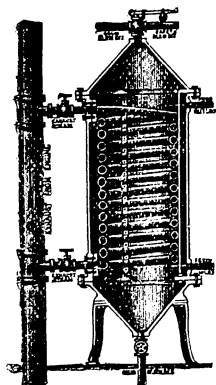
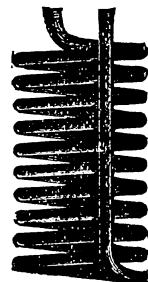


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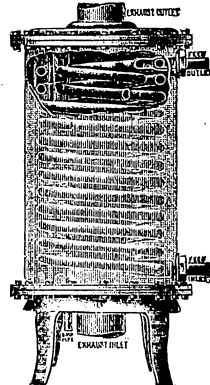
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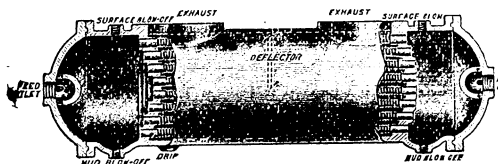
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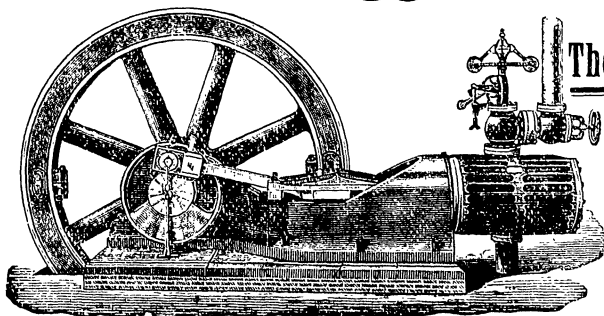
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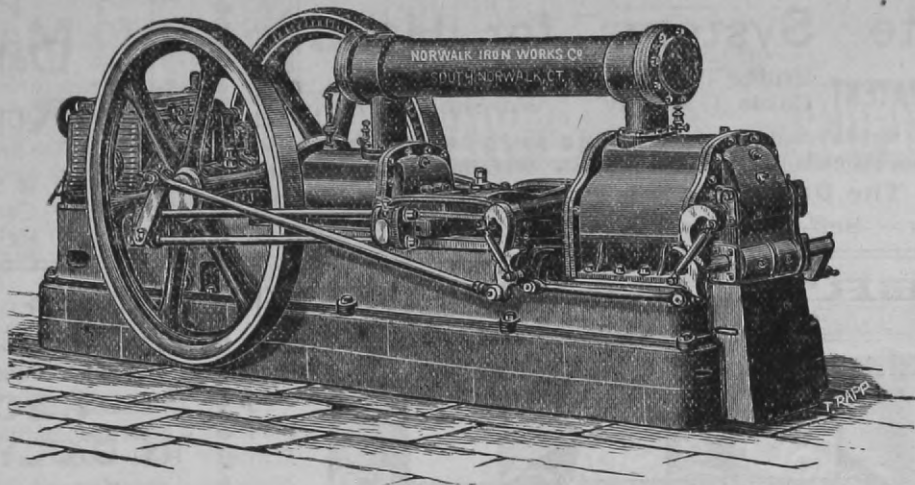
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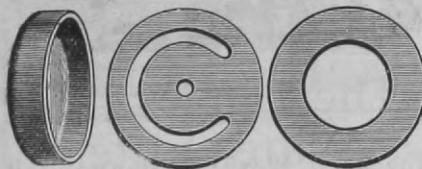
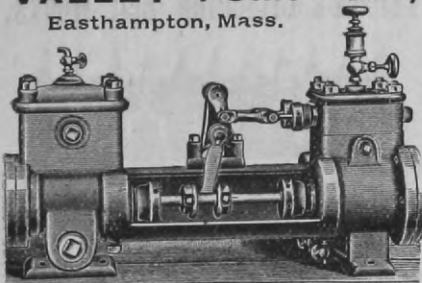


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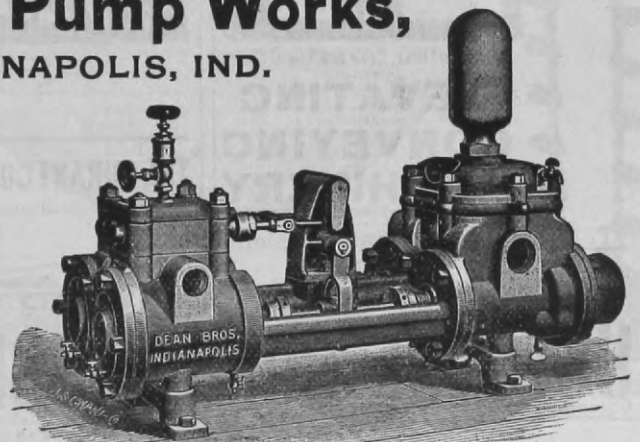
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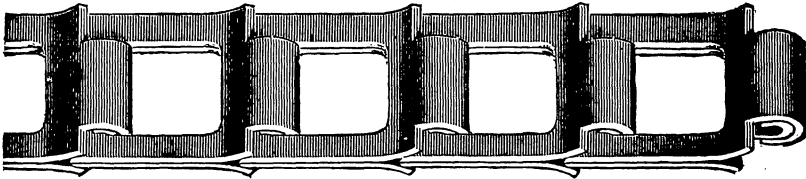
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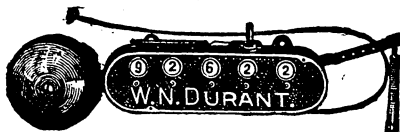
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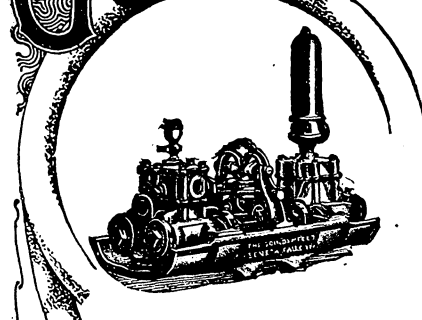
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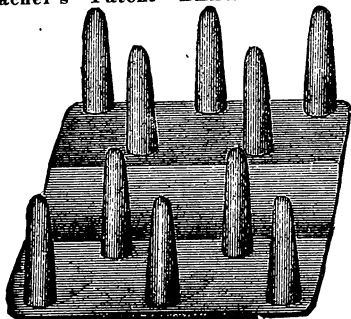
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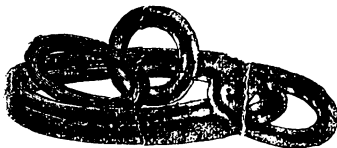
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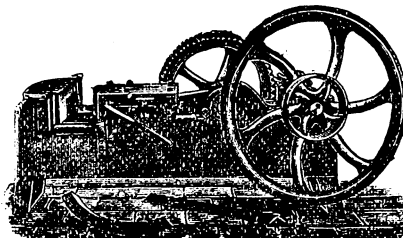
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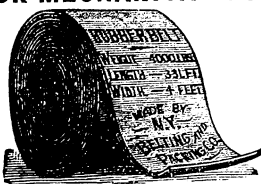
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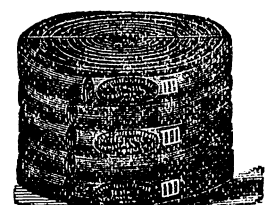


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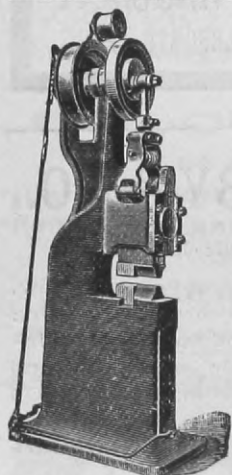
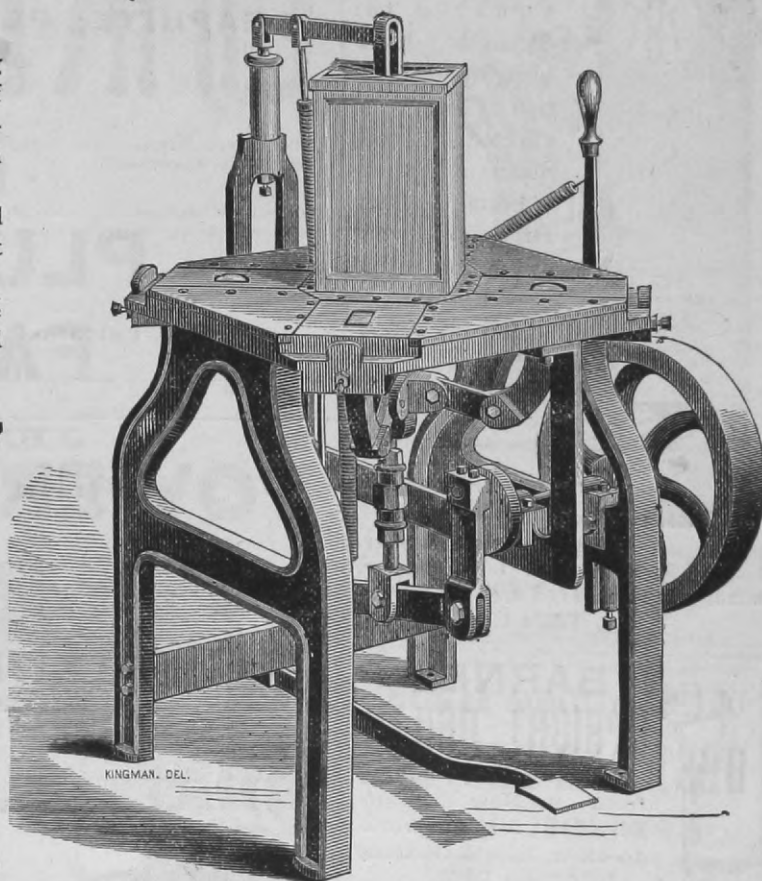
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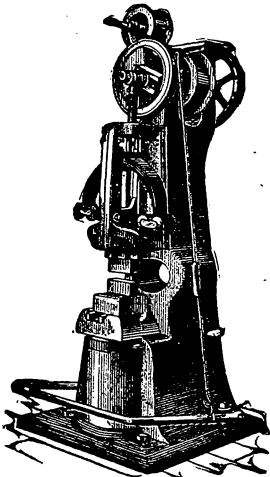
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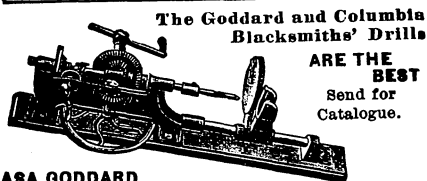


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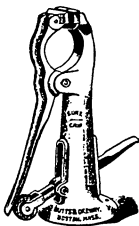
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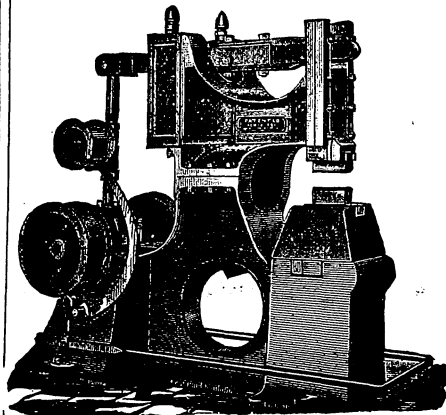
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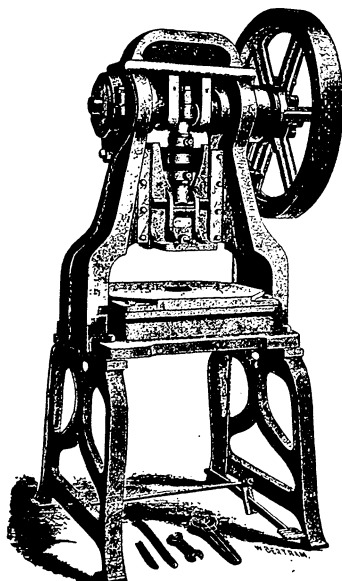
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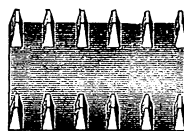
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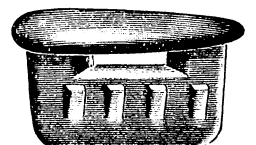
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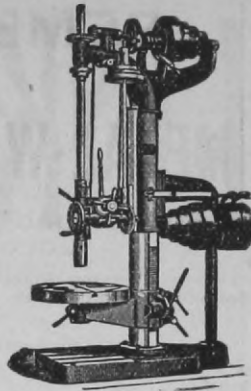
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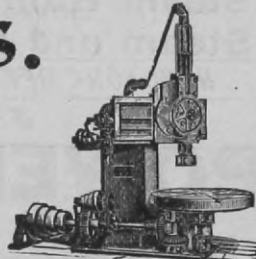
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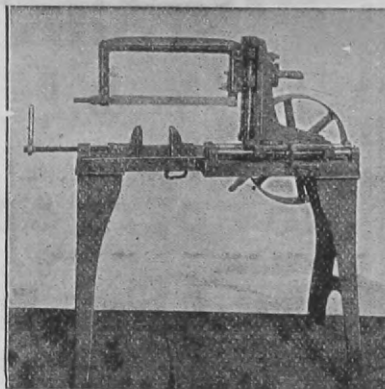
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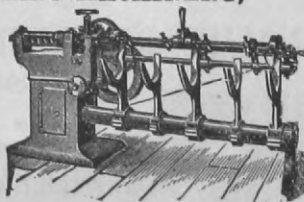
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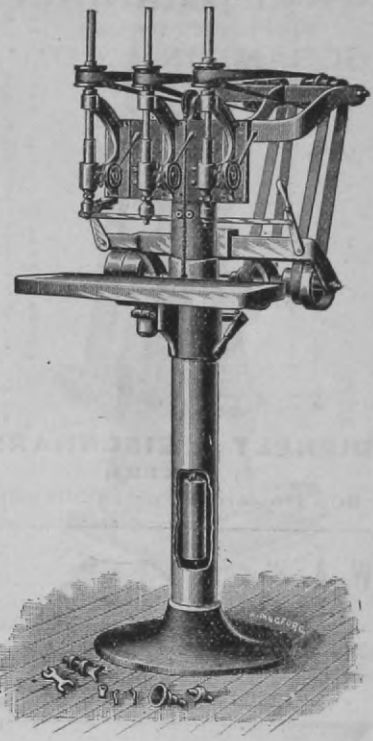


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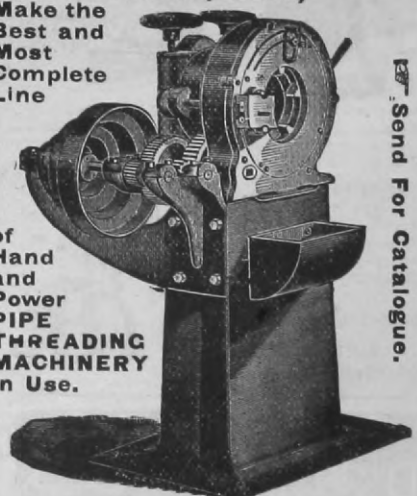
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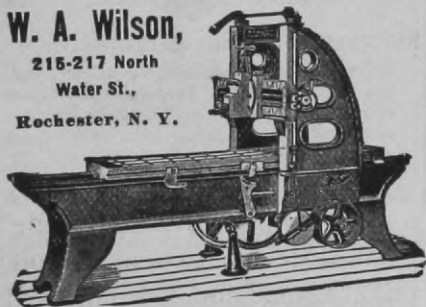
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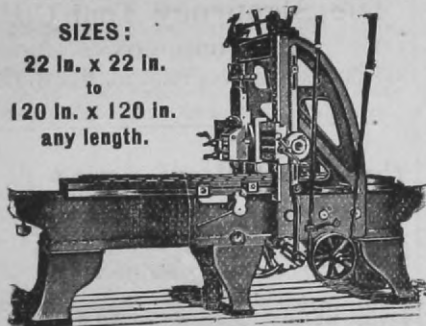
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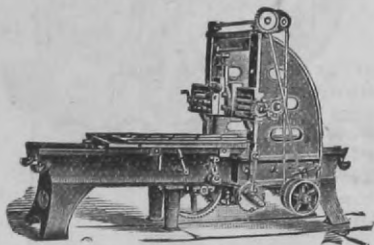
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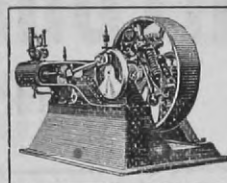
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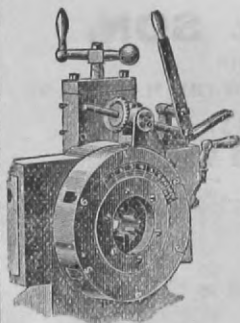
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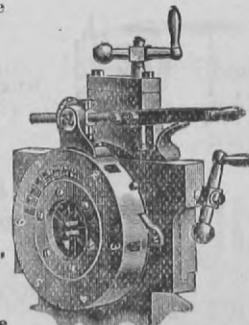
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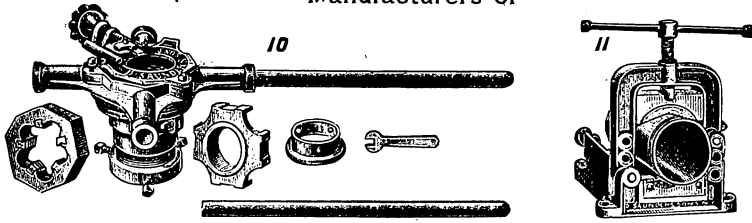
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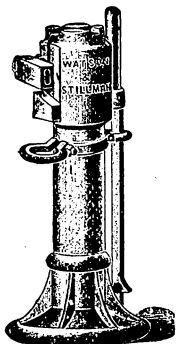
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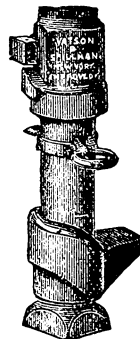
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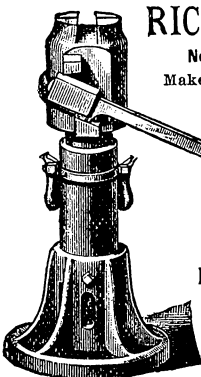
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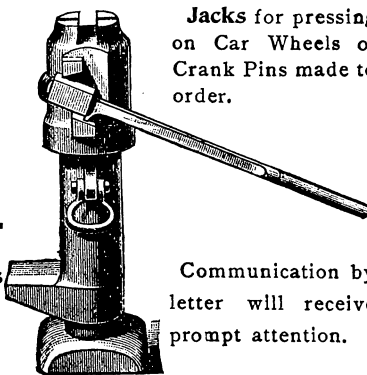
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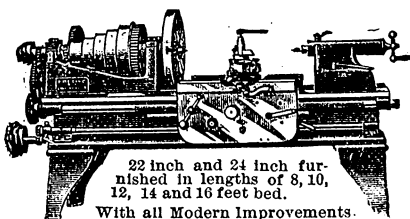
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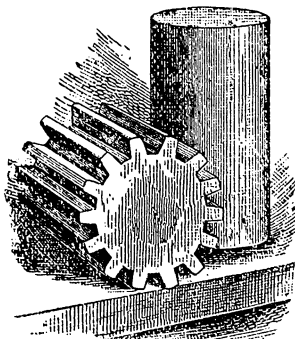
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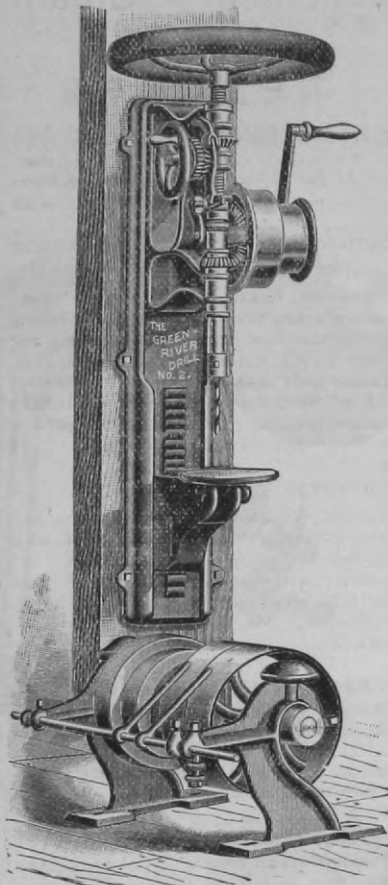
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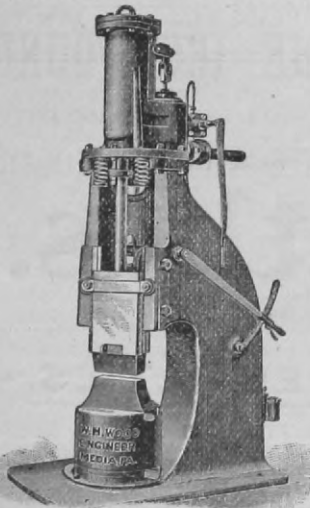


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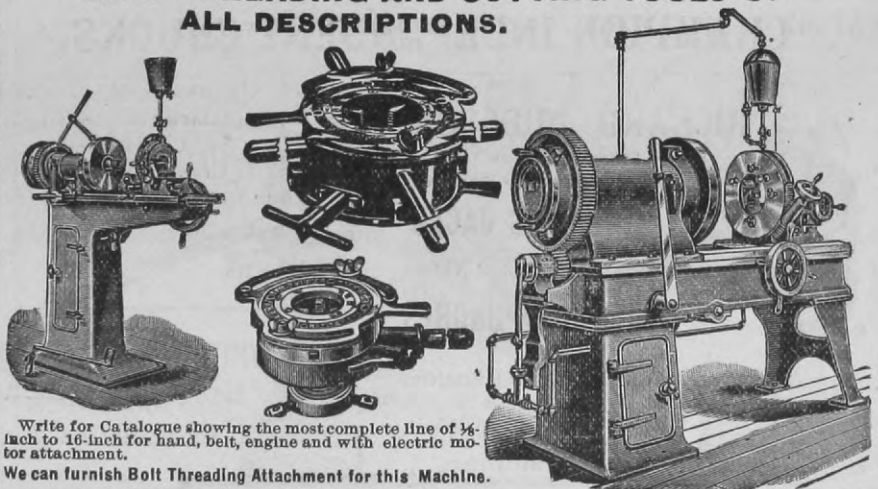


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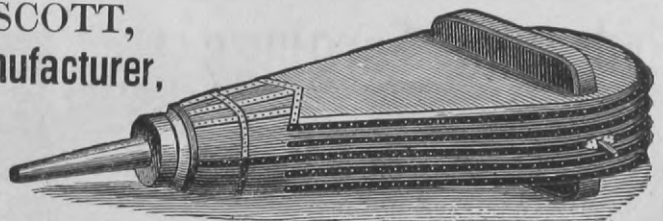
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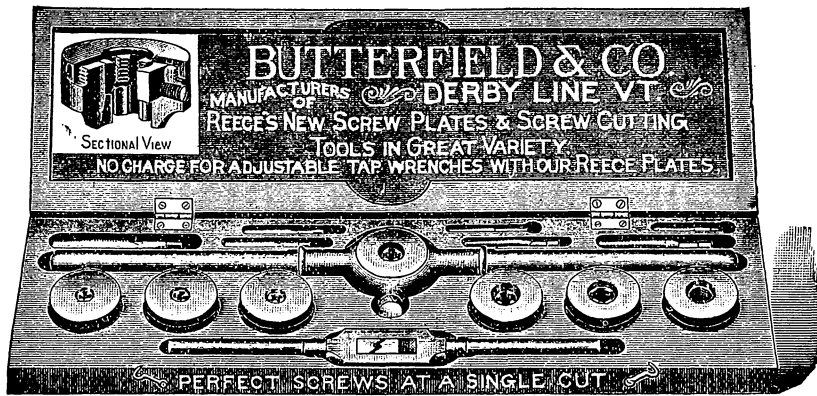
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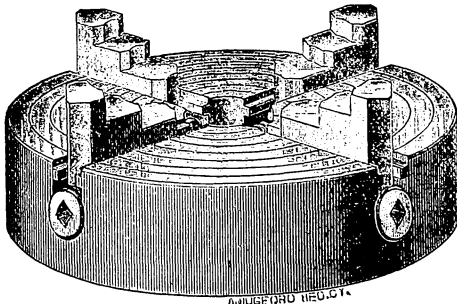
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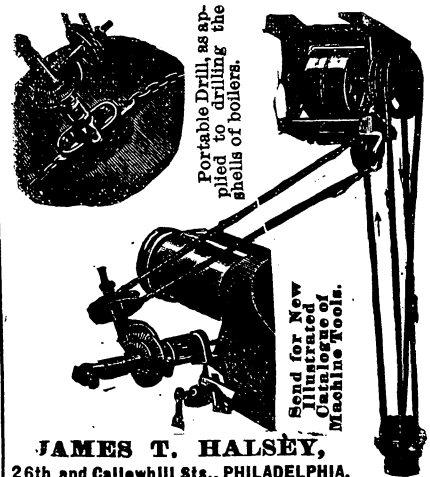
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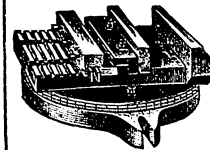
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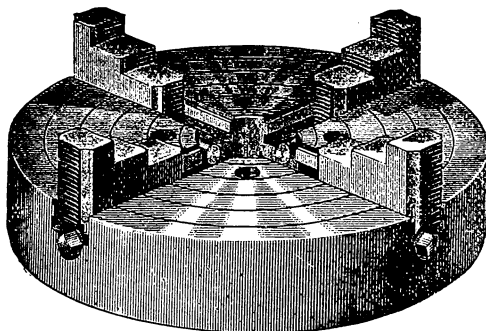
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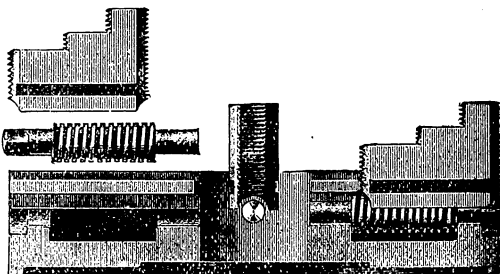
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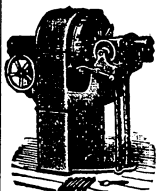


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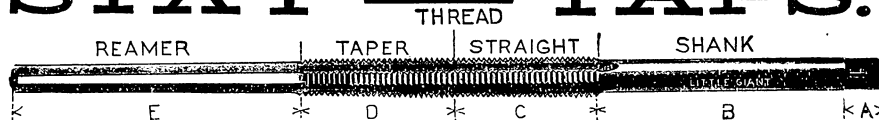
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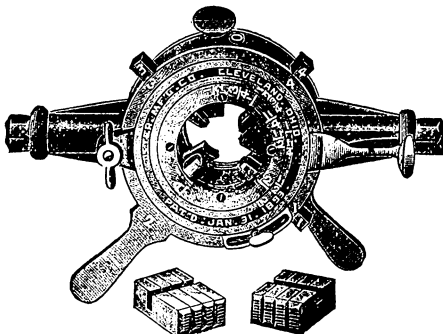
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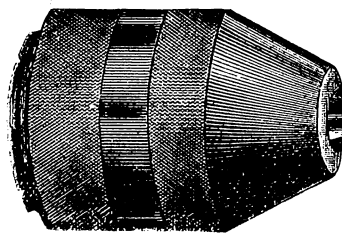
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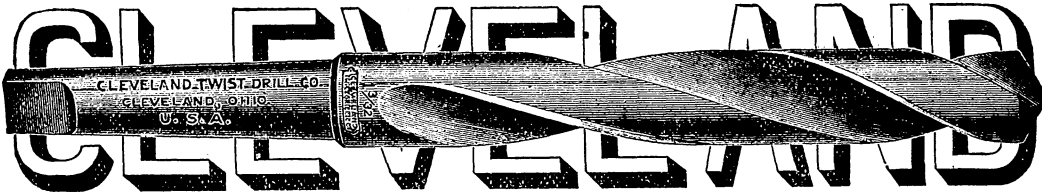
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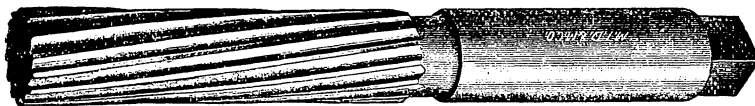


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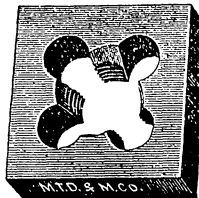
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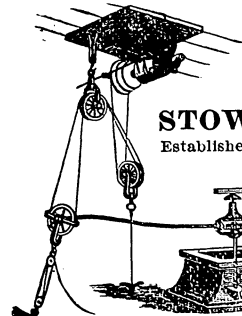


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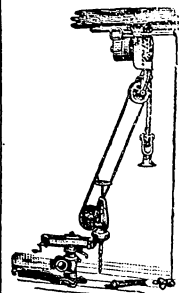
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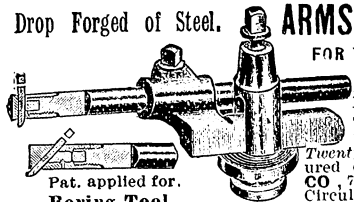
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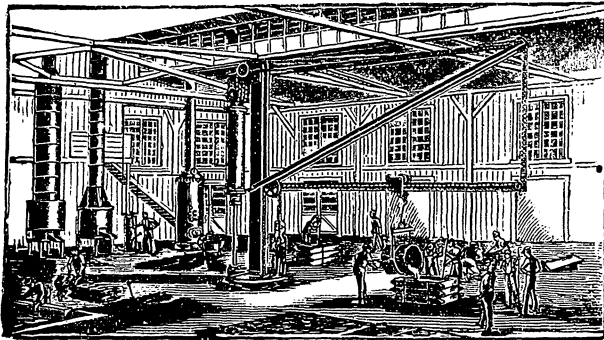
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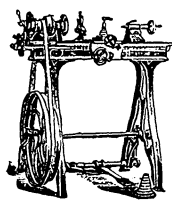
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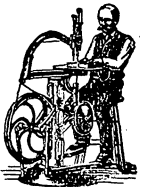
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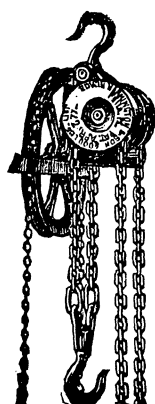
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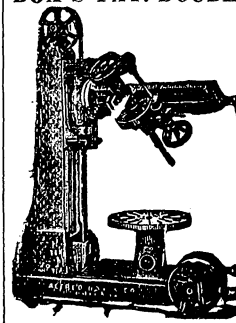
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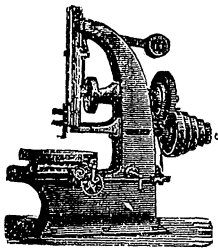
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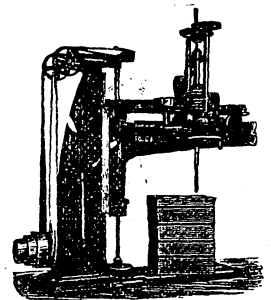


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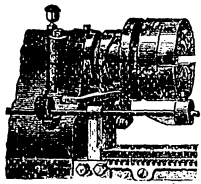
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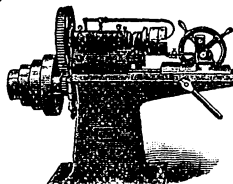
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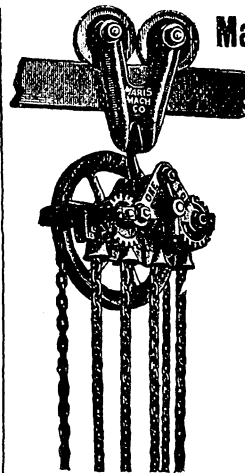
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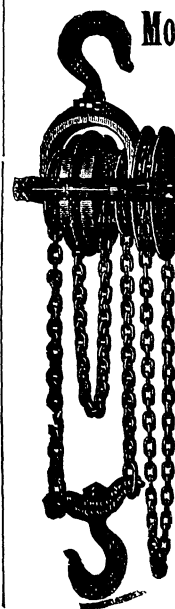
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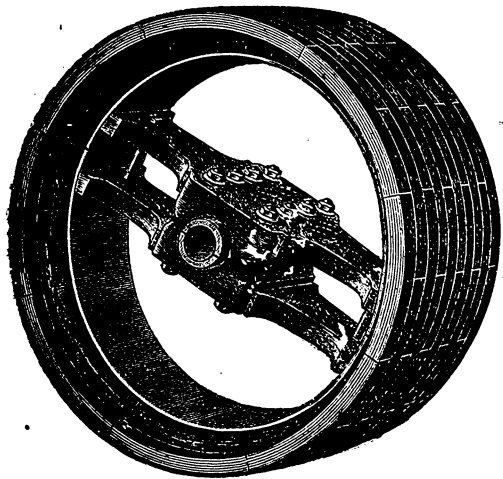
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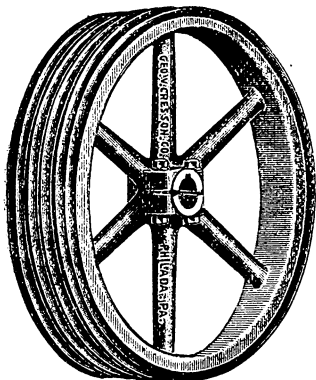
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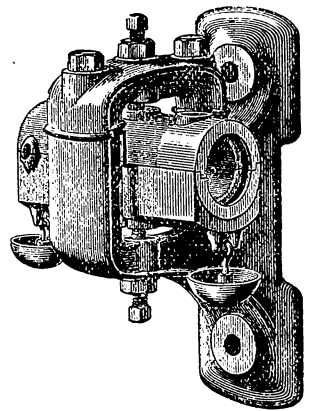
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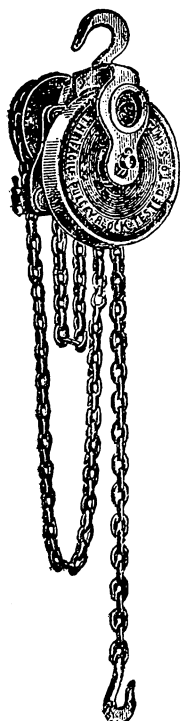
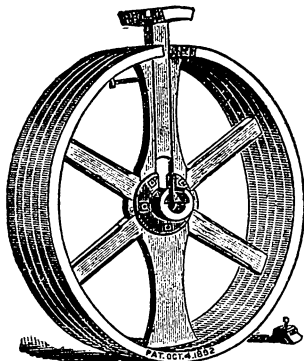
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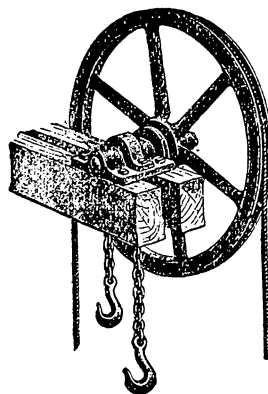


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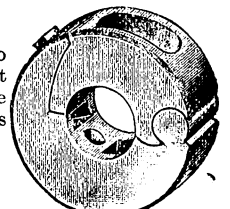
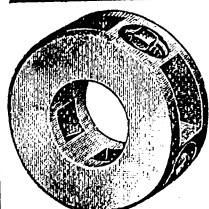
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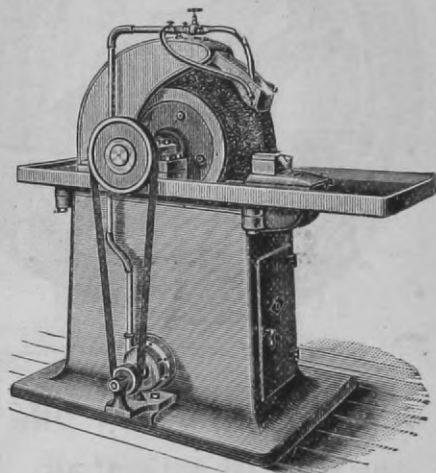


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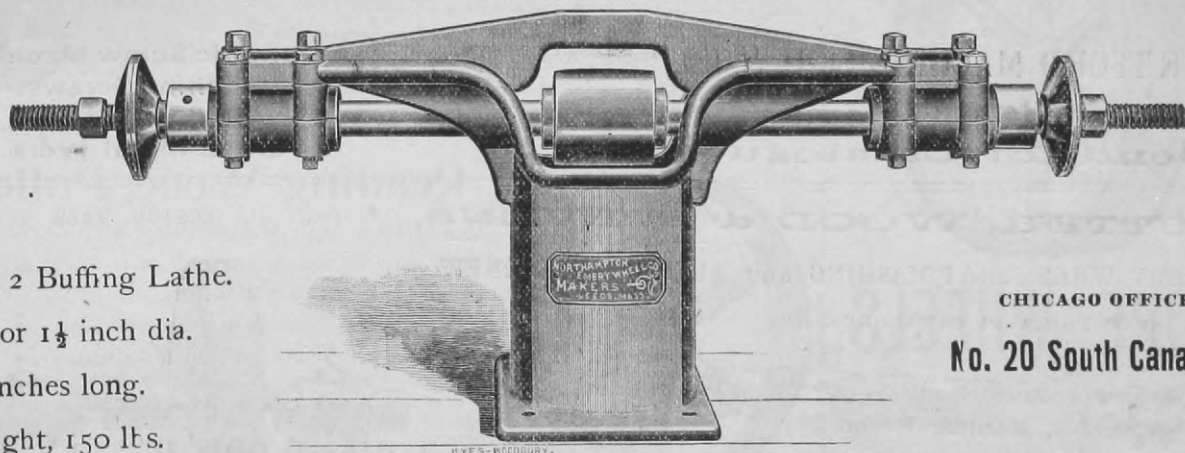


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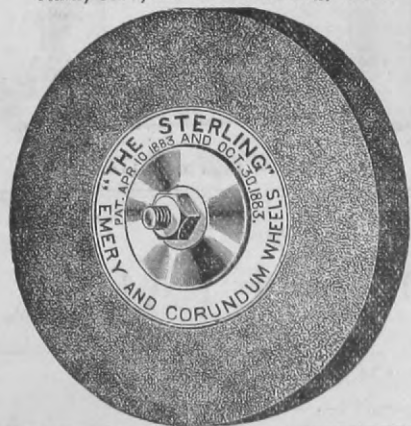
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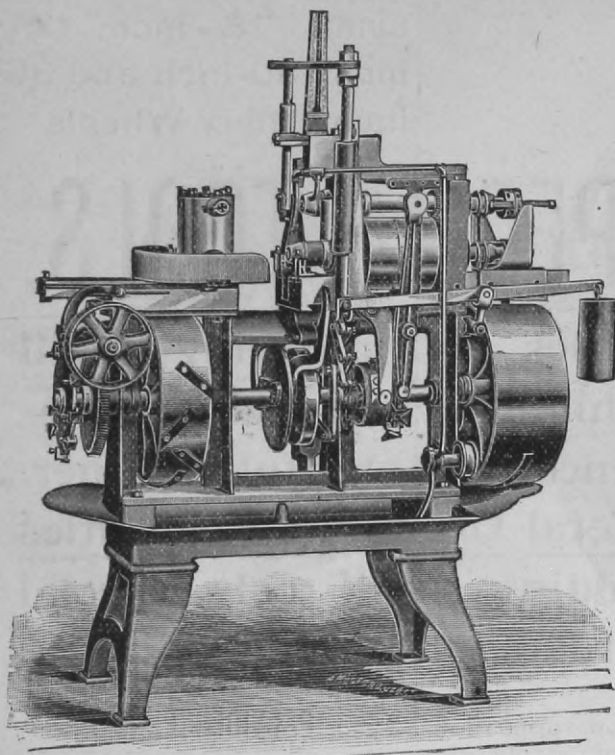
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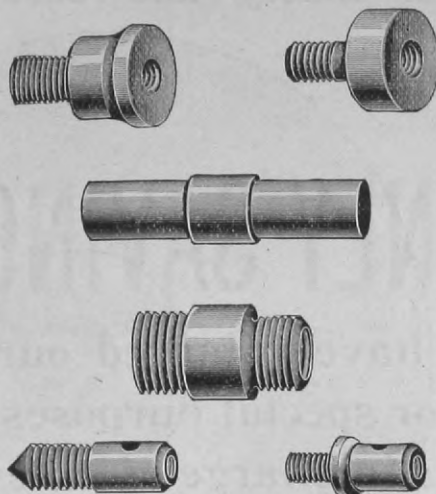
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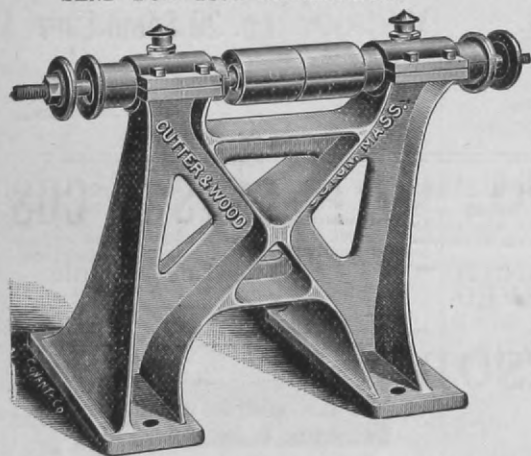
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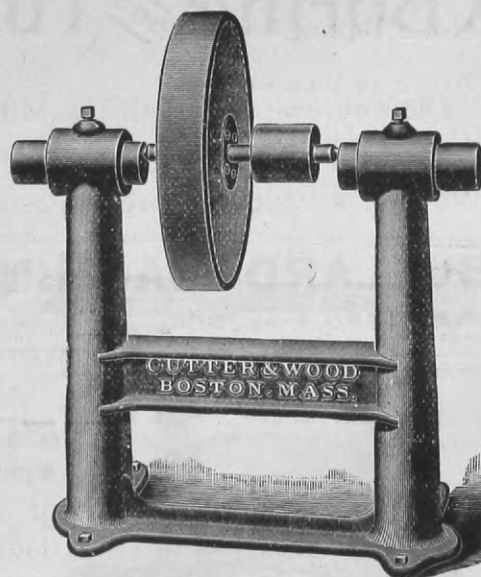
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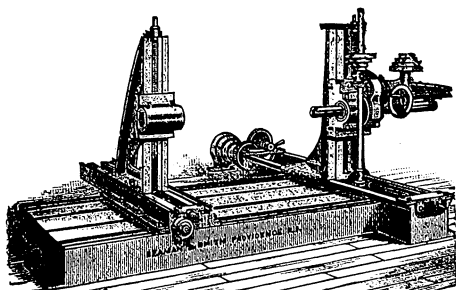
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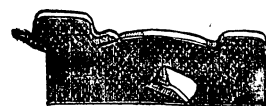
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21 in. x 10 and 13 1/2 ft. Eng. Lathe.
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Second-hand Tools.

LATHES.

- 1 13 x 6 Pratt & Whitney Lathe.
- 1 14 x 5 Wheeler Lathe.
- 1 15 x 6 Porter Lathe.
- 1 16 x 6 Bogart Lathe.
- 1 18 x 6 Putnam Lathe.
- 1 18 x 8 New Haven Lathe.
- 1 20 x 12 Blaisdell Lathe.
- 1 21 x 8 Lodge & Davis Lathe.
- 1 24 x 12 Lodge & Davis Lathe.
- 1 30 x 23 Sellers Lathe.

PLANERS.

- 1 22 x 23 x 4 Whitcomb Planer.
- 1 24 x 24 x 5 Steptoe Planer.
- 1 24 x 24 x 7 New Haven Planer.
- 1 24 x 24 x 8 Lodge & Davis Planer.
- 1 36 x 36 x 8 Cove Planer.

DRILLS.

- 1 3 ft. Batman Radial Drill.
- 1 20 in. Lodge & Davis Lever Drill.
- 1 20 in. Lodge & Davis Sliding Head Drill.
- 1 28 in. Lodge & Davis Standard Drill.

SHAPERS.

- 1 15 in. Juengst Shaper.
- 1 18 in. Shaper.
- 1 30 in. Lodge & Davis Crank Shaper.

MISCELLANEOUS.

- 1 80 lb. Long & Allstatter Helve Hammer.
- 1 5/8 in. Long & Allstatter Punch and Shear.
- 1 Buffalo Forge.
- 1 B. G. Plain Milling Machine.

The Lodge & Davis

MACHINE TOOL CO.,
CINCINNATI, O., U. S. A.

SECOND-HAND MACHINERY.

- 1 Iron Planer 60 in. x 60 in. x 20 ft., 2 heads on Cross Rail.
- 1 Iron Planer 40 in. x 36 in. x 12 ft. 1 30 in. x 30 in. x 8 ft.
- 1 Iron Planer, D. W. Pond, 28 in. x 26 in. x 8 ft.
- 1 Engine Lathe 60 in. x 18 1/2 ft. New. Bargain.
- 1 Engine Lathe 24 ft. bed, 54 in. swing, D. W. Pond make, A1.
- 1 Engine Lathe 41 in. x 14 ft., New Haven make, A1.
- 1 Engine Lathe 48 in. x 16 ft., raised to 60 in., Putnam make.
- 1 Engine Lathe 34 in. x 8 ft. 1 30 in. x 14 ft., Putnam.
- 1 Engine Lathe 26 in. x 10 ft., D. W. Pond make.
- 1 Engine Lathe 20 in. x 12 ft., New Haven. 1 18 in. x 8 ft., New Haven.
- 1 Drilling Machine 40 in., B. G. S. F. 1 36 in., B. G. S. F., both New Haven.
- 1 6 in. x 10 in. Eureka Steam Hammer, A1.
- 1 8 in. x 12 in. Hoisting Engine.
- 1 14 in. x 52 in. Watts & Campbell Engine.
- 1 14 in. x 56 in. Watts & Campbell Engine.

All kinds of Iron and Wood Working Machinery.
Lists sent. NEW YORK MACHINERY DEPOT,
Office 178 Broadway, N. Y.

FOR SALE.

SECOND-HAND.

ENGINES, Horizontal and Vertical. All types and sizes up to 2000 H.-P.
BOILERS, Vertical and Horizontal, and 3 Batteries of "Helve" water tube.
MILLS, 3 high, 12 in., 20 in., 30 in., and 36 in.
1 Reversing 32 in. Blooming Mill complete.
STEAM HAMMERS. Various sizes up to 10 ton.
SHEARS for Bars, Rails, Blooms and Plates.
SQUEEZERS, ROLL LATHES, CRANES, GRINDING PANS, MACHINE SHOP TOOLS, &c.

LOCOMOTIVES. Fine condition, various sizes and gauges.

"If you don't see what you want, ask for it" of

B. M. EVERSON,
301 Smithfield St., Pittsburgh, Pa.

SECOND-HAND MACHINERY FOR SALE.

Planers, Drills and Lathes, good as new, for cash.

DIETZ, SCHUMACHER & CO.,
Cincinnati, O.

WANTED.

To furnish reasonable estimates on specialties in light metal work.

CLARK & COWLES, Plainville, Conn.
Manufacturers of Clock Trimmings, Rivets, Springs &c.

Locomotives.

- 1 36 tons Stan. Gauge Pass. Loco.
- 5 37 tons " " Shifting Loco.
- 1 20 tons " " Saddle Tank Loco.
- 2 10 tons " " Saddle Tank Loco.
- 1 7 1/2 tons " " Saddle Tank Loco.
- 1 30 tons 36 in. gauge 8 driver Freight Loco.
- 1 21 tons " " 6 " Saddle Tank.
- 1 16 tons " " 6 " With Tender.
- 1 18 tons " " 4 " Saddle Tank.
- 1 15 tons " " 4 " Back Truck.
- 1 11 tons " " 4 " Saddle Tank.
- 1 7 1/2 tons " " 4 " Saddle Tank.

And many others.
THOS. P. CONARD,
206 Walnut Place, Philadelphia.

FOR SALE. SECOND-HAND.

CORLISS ENGINES, 36 in. dia. and under.
PUMPS of all kinds and sizes.
DYNAMOS, 50 to 500 light capacity.
BOLLERS, (Stationary), 4-150 H. P.
LOCOMOTIVE BOILERS, 20-250 H. P.
AIR COMPRESSORS, (6 Sizes.)
ROCK DRILLS, 1 1/2 in., 5 in. dia.
ICE MACHINES, 2 of 15 tons each.
HOISTING and DREDGING ENGINES, 10-500 H. P.

TANKS, Round, Square, Closed and Open.
Write for what you need to

MARVIN BRIGGS, 12 Broadway, N. Y.

DOUBLE CORLISS CONDENSING ENGINE, 600 H. P., One 15 inch by 42 inch Corliss Engine, 125 H. P., Double Automatic Engine, 350 H. P., two 100 H. P. Phoenix Automatic Compound Engines, 45 and 5 H. P., Westinghouse Engine, one 80 H. P. Beck Engine, one 7 x 7 Southwark Automatic Engine, one H. P. Otto Gas Engine, 100, 200, 300 and 500 H. P. Feed Water Heaters, 30 to 100 H. P. Return Tubulars, 70 H. P. Locomotives, 60 H. P. Vertical Boilers, good for 100 pounds.
FRANK TOOMEY, Office 131 N. 3d St. Ware houses-974 to 980 Breach Street, 159 to 161 Canal Street, Philadelphia.

SOME BARGAINS HERE.

1 Hendey Shaper, 15 in. stroke, Imp. vis.
1 14 x 6 Screw Cutting Engine Lathe. New.
Pattern Makers' Speed Lathe, 7 ft. Bed, \$40. New.
2 1/2 Hendey Cutting-off Machine. New.
44 in. C. & D. Resaw. Fine condition.
Radial Drill, 5 1/2 ft. arm.
Axle Cutting-off Machine, Double Head, cut 9 1/2 dia.
Quantity 2d hand Dodge Pulleys. Cheap.
Safety Construction Company's combined Trap and Pump.
And other machinery, new and second hand. Write for prices. Machinery Supply Company,
59, 41 and 43 Central Ave., Rochester, N. Y.

A LARGE ADDITION TO OUR STOCK OF CORLISS ENGINES.

Also HIGH SPEED, Etc.

SEND FOR CATALOGUE.

Corliss-26 x 48, 28 x 36, 30 x 72, 10 x 20. Several large sizes guaranteed, viz.: 18 x 48, 23 x 48, 28 x 48, 30 x 48, 26 x 60. Many other sizes on hand. Porter-Allen 11 x 16 and other High Speeds. An assortment of Horizontal Tubular Boilers, Large Duplex Fire Pump, Brennan Crusher, Platform Scales, Burr Mill, Bogardus Mill, etc., etc.

G. M. CLAPP, 74 Cortland St., N. Y.

FOR SALE.

- 26 Arc Light U. S. Electric Lighting Co. Dynamos.
- 6 Hochhausen Dynamos.
- 100 Arc Lamps.
- 2 Double Hoisting Engines.
- 2 large Ferracute Circular Shears.
- 1 Bennett Air Compressor, 18-20 x 30.
- 3 Steam Fire Engines.
- 1 50-ton Track Scale.
- 230 New Steel Electric Car Wheels.

WALSH'S SONS & CO.,
260-264 Washington St., Newark, N. J.
Dealers in Scrap Iron, Metals, Machinery, etc.

WE WANT TO BUY SCRAP,

Iron or Steel Rails,
Busheling Scrap,
Bridge Material, &c.

Will pay spot cash for the above in carload lots.

C. H. SIBELL & CO.,
Manhattan Building, Chicago.

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SECOND-HAND MACHINE TOOLS.

ENGINE LATHES.

- 13 in. x 5 ft. Phenix.
- 15 in. x 6 ft. Blaisdell.
- 16 in. x 8 ft. Fitchburg.
- 16 in. x 6 ft. Perkins.
- 16 in. x 7 ft. Bement.
- 16 in. x 8 ft. Perkins, taper.
- 16 in. x 6 ft. Blaisdell.
- 18 in. x 6 ft. New Haven.
- 18 in. x 6 ft. Bradford.
- 18 in. x 6 ft. Blaisdell.
- 18 in. x 10 ft. Blaisdell.
- 20 in. x 6 ft. Bullard.
- 29 in. x 12 ft. #field.
- 30 in. x 12 ft. Blaisdell.

PLANERS.

- 20 in. x 20 in. x 5 ft. Ames.
- 22 in. x 22 in. x 4 ft. L. W. Pond.
- 24 in. x 24 in. x 6 ft. Whitcomb.
- 24 in. x 24 in. x 5 ft. Putnam.
- 28 in. x 28 in. x 7 ft. New Haven.

SHAPERS.

- 10 in. Juengst Crank.
- 10 in. Wood & Light, Traverse Head.
- 15 in. Kelly Crank.
- 18 in. Putnam, Traverse Head.

Also a large number of other machines. Write for a complete list and detailed description.

THE GARVIN MACHINE CO.,

Laight & Canal Sts., New York.
Also 51 North 7th St., Philadelphia, Pa.

!!! FOR SALE !!!

RAKER BLOWERS, Nos. 3, 4, 5, 6, and 7.
ROOT BLOWERS, Nos. 1, 2, 3, 5, 6 and 7.
DAVID W. POND PLANNER, 26 in. x 26 in. x 8 ft., latest pattern.
9 HEWES & PHILLIPS LATHES, from 12 in. to 20 in. Swine.
A variety of Engines, Boilers, Pumps, Tanks, Crushers, Compressors, Rock Drills, &c.
Name your wants.
C. R. BIGELOW, Machinery Expert,
45 Dey St., New York City.

MACHINERY FOR SALE.

Planer 28 in. x 24 in. x 7 ft. New.
Drill Press, 40 in. swing. New.
Engine Lathe, 24 in. x 25 ft. bed. 2d hand.
Root Blowers, Nos. 1, 2, 5 and 6. 2d hand.
Haskin Vertical Engine, 9 x 9. 2d hand.
Baxter Engine and Boiler, 6 and 8 H. P. 2d hand.
Vertical Boiler, 40 H. P. 2d hand.
Open-die Bolt Cutter 14 to 1 1/4 in. 2d hand.
Write us before buying. COOKE & CO.,
Machinery and Supplies, 183 and 185 Washington St., New York.

FOR SALE.

Lathe, 52 in. swing, 40 ft. long, triple geared.
New Steam Engines, 16 x 24, 14 x 24, 12 x 24, 6 x 12.
Rebuilt Engines, 14 x 24, one pair 4 x 8.
Five hundred iron pulleys 10 ft. dia. and less.
WM. A. BOLE, Trustee,
25th St., Cor. Liberty Ave., Pittsburgh, Pa.

FOR SALE.

2 Double Deck Boilers about 40 H.-P. each, cheap. Hoisting Engine, Cylinder Boilers for Stacks, 30, 36 and 42 in. diameter. Round and Square Iron Tanks. Blow Offs. 5 Brass Cannons about 1400 or 1500 pounds each. Good order. All kinds of Scrap Iron and Metals on hand.

BUSSENIUS & CUNLIFFE,
17th and Washington Ave. Philadelphia.

FOR SALE.

Rolling Mill Engines.

- 28 x 60 Horizontal, heavy wheel.
- 24 x 60 " Slide Valve.
- 14 x 30 " " "
- 18 x 24 " " "
- 32 x 48 Vertical, 23 ton wheel.
- 28 x 30 " 20 " "
- 30 x 30 " 20 " "

Also Rotary Squeezer, Rail Shear, Scrap and Bar Shears, 12 in. Bar Mill, 20 in. Muck Mill, 30 in. Plate Train. One Structural Jib Crane, 30 tons cap. Address

C. W. SCHULTZ & CO.,
308 Walnut St., PHILADELPHIA.

SECOND-HAND.

Wanted to buy. Geared Shaper, 18 in. or 24 in. Upright Hammer, 34 or 40 lbs.
I. I. FARRAR, Toolmaker,
Sheridan Ave., Paterson, N. J.

SECOND-HAND MACHINERY.**ENGINE LATHES.**

- 10 in., 11 in. and 13 in. Swing, 4 and 5 ft. Bed Lathes, Reed, Prentice and L. & J.
- 15 in., 16 in., 18 in., 19 in. and 20 in. Swing, 6 and 8 ft. Bed Lathes, Dustin, Pond, Young, Fife and Bullard.
- 24 in., 26 in., 28 in., 32 in. and 36 in. Swing, 10 ft., 16 ft. and 18 ft. Bed Lathes, Fife, Dustin, Blaisdell and Perkins.

PLANERS.

- 1 17 in. x 17 in. x 30 in. Hand Planer.
- 1 16 in. x 16 in. x 3 ft. Crank Planer.
- 1 17 in. x 17 in. x 3 ft. L. & M. Planer.
- 1 20 in. x 20 in. x 4 ft. L. & M. Planer.
- 1 24 in. x 24 in. x 6 ft. Pease Planer.
- 1 27 in. x 27 in. x 5 ft. White Planer.
- 1 60 in. x 60 in. x 22 ft. Heavy Planer with 4 heads.
- 1 60 in. x 60 in. x 22 ft. Hepworth, 1 head.
- 1 8 ft. Boring and Turning Mill with pulley attachment.

DRILL PRESSES.

- 2 20 in. Drill Presses, Prentice & Davis.
- 1 20 in. x 36 in. Gap Lathe.
- 3 Slat Drills, 1 one-spindle, 2 two-spindle.
- 2 Pratt & Whitney 1 and 2 spindle.
- 6 bench Drills.
- 1 60 in. Heavy Geared Post Drill.
- 1 each No. 2, 3 and 4 Garvin Gang Drills.

SHAPERS.

- 15 in. Stroke, Smith.
- 15 in. G. & E. Make.
- 17 in. and 24 in. Chase & Hendy.

SPEED LATHES.

- 10 in., 12 in. and 14 in. Swing, 3, 4 and 5 ft. Beds, Garvin and Spencer.

ALSO LARGE STOCK NEW TOOLS.

THE NILES TOOL WORKS CO.
Eastern Branch, 136, 138 Liberty St., N. Y. City.

RAILS FOR SALE. Second-hand Relaying.

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| 1000 tons 60 lb. Steel. | 50 tons 35 lb. Iron. |
| 150 " 60 lb. " | 150 " 30 lb. " |
| 1000 " 66 lb. " | 360 " 25 lb. Steel. |
| 150 " 52 lb. Iron | 60 " 20 lb. " |
| and Steel. | 20 " 36 lb., 4 in. |
| 40 tons 40 lb. Iron. | Johnson Girder |
| 250 " 40 lb. Steel | Balls. |
- 27 different gauge second-hand locomotives.
- J. H. RICHARDSON & CO.,**
Pittsburgh, Pa.

For Sale, Very Low for Cash.

1000 tons relaying 60-lb. Steel T Rails, 500 tons relaying Steel Street Rails, side bearing, 35 to 47 lbs. sections. Also 3 tanks 7½ ft. diameter, 10 ft. high.

WM. H. PERRY & CO., Providence, R. I.

A BARGAIN.

A fine business opportunity for a live business man or two partners who have \$25,000 to invest in a first-class, old, well established and well located jobbing and retail Hardware business, which did not lose money last year. Stock is well assorted. Good location in large Eastern City. Reasonable lease of premises can be continued. This will bear full investigation. Parties who can command above amount of capital address

"BARGAIN," Box 315,

office of *The Iron Age*, 96-102 Reade St., N. Y.

FOR SALE.—To close an estate, on account of death of principal. An old and well established jobbing and retail Hardware business, located in one of the largest manufacturing cities in the State of California. The best location in the State outside of San Francisco for a jobbing business. Stock is well assorted and consists of shelf and builders' hardware, mechanics' tools, bar and sheet iron, etc. Will inventory about \$40,000. Terms and statements to principals only. Address "A. B. C.," Box 104, office of *The Iron Age*, 96-102 Reade St., N. Y.

FOR SALE.

COUNTY OR STATE RIGHTS for a very superior cheap portable steel or iron **CULVERT BRIDGE**. It is adapted to all small streams, runs, etc. It is just the thing to improve **ROADS AND HIGHWAYS**. It can be placed below or on the level with the road. It also makes a most excellent **RAILROAD CULVERT, GUTTER CROSSING AND CITY OR TOWN CULVERT**. Apply to

W. A. NICHOLS,
Girard Building, Philadelphia, Pa.

To File Manufacturers.

We have just taken for sale a complete plant of a File manufacturing concern situated within an hour's ride from Boston.

It consists of a number of the Hess cutting machines, helve and upright Bradley hammers, shears a complete outfit for heating by oil, with necessary tanks, pump, pipes, gauges, etc., about a carload of grindstones (face 18 in., diameter 20 in.), a number of tons of file steel of different shapes, which have never been cut or worked, also a lot of forged blanks. In fact, the plant is complete in every way and has been run but a very short time and everything is in fine order. This outfit must be disposed of at once and we propose to sell it in a lump or by pieces, as may seem most advantageous.

If you are interested, kindly let us hear from you, and promptly.

HILL, CLARKE & CO.,

156 Oliver St., Boston, Mass.

FOR SALE.

A good profitable Hardware, Implement and Harness business in a small but growing town in Iowa. Will sell all together or separate, to suit purchaser. Will also sell stock and rent buildings if preferred. Address

ENABNIT & MANZ,
Meservey, Iowa.

Chicago Storage Warehouse.

General merchandise storage, with desk room if wanted, situate in wholesale district.

Apply to

C. P. SHERWOOD,
294-300 Franklin Street,
Chicago, Ill.

FOR SALE,

in one of the best agricultural and fruit growing sections of California, a general stock of Hardware, Agricultural Implements, Stoves, Tinware, &c. Stock will now invoice about \$30,000, but can be reduced. Best of reasons for selling. Inquire of

W. W. MONTAGUE & CO., or DUNHAM, CARRIGAN & HAYDEN CO., San Francisco, Cal.

WANTED.

By a large manufacturing establishment some new specialty to make and sell to the Jobbing Hardware, Crockery or Grocery trade. Address

"NEW SPECIALTIES,"

office of *The Iron Age*, 96-102 Reade Street, New York.

A Rare Business Chance.

For sale, in a live, wide awake Western city, a Hardware, Agricultural Implement, Stove, Tinware and Plumbing business having a good retail and jobbing trade, that extends over a very large territory. Stock will now invoice about \$30,000 but can be reduced. Best of reasons for selling. Full information and references furnished to those meaning business. Location the best in the United States for any one suffering from pulmonary troubles. Address

FRANK MARION, care Maxwell House,
Nashville, Tenn.

FOR SALE.

A new iron building for immediate shipment, 81 ft. wide, 200 ft. long, consisting of a main span 61 ft wide, with lean-to on one side 20 ft. wide. The trusses are sufficiently strong to carry a line of shafting and light jib crane. This building is suitable for a Machine Shop, Tin Plate Mill, Rolling Mill, etc. For further information address

SHIFFLER BRIDGE CO.,
Pittsburg, Pa.

WANTED.

A manufacturer wants to add to his line some new specialties that will sell to the Jobbing Hardware, Saddlery or Woodenware Trade. Address "JOB-BING TRADE," office of *The Iron Age*, 96-102 Reade Street New York.

WANTED.

To buy for cash, first-class second-hand Engine Lathes, Planers, Drill Presses, Shapers, Milling Machines, Etc.,

Address

THE
FOSDICK & PLUCKER
MACHINE TOOL
CO.,
Cincinnati, Ohio.

PITTSBURGH SALES AGENCY,

J. H. HILLMAN, Manager,

No. 8 Wood St.,
Pittsburgh, Pa.,

Offers for sale at very low prices BESSEMER STEEL WORKS; STRUCTURAL STEEL MILLS, also STEEL MILL FOR ROLLING BARS AND COLD ROLLING, 2 BLAST FURNACES, RUSTLESS IRON WORKS, GLASS WORKS, FOUNDRY, PLANING MILL, BRICK WORKS, and numerous other manufacturing interests and large quantity of very desirable Coal Properties improved and unimproved.

Dealers in Coal and Iron Lands.

Examination and Reports

on Properties.

References on Application.

WANTED.

One Standard gauge short connected saddle tank 20 ton locomotive, in good condition.
One 10 to 15 ton traveling derrick or crane, any gauge.

THOMAS CARLIN'S SONS,
Allegheny, Pa.

BUILDINGS AND POWER For Sale and To Let

Good buildings for various manufacturing purposes. Excellent and never failing water power, also steam power, steam heat and electric lights. Land for the erection of other buildings if required. Shipping facilities are the best. The whole or a part of this plant can be had on very reasonable terms. For any particulars address

"X 100,"

office of *The Iron Age*, 96-102 Reade St., New York.**TO RENT.**

A comfortable and convenient office, nicely carpeted, steam heat and gas, including desk and office furniture, on second floor, No 2½ Murray St. Also floor space if desired. Cheap to the right party.

D. A. GOODRICH.

FOR SALE.

The old established Iron, Steel and Storage business conducted for thirty years or more by the late Albert T. Converse, in Norwich, Conn.

Since Mr. Converse's decease the business has been conducted by the Administrator at the old location, No. 23 Commerce St.

The property for sale consists of Warehouse containing store and three lofts, with wharf property, office and wareroom furniture and fixtures and stock of Iron and Steel.

The Real Estate, Fixtures and Furniture and stock of Iron and Steel will be sold all together at a low cash price, or, if not possible to do this, they may be sold separately.

Any one interested may obtain particulars by addressing S. T. HOLBROOK, Administrator, River Ave., or WILLIAM F. CONVERSE, 23 Commerce Street, Norwich, Conn.

IN THE MATTER OF THE ONTARIO FORGE AND BOLT COM- PANY OF SWANSEA (near Toronto), LIMITED, IN LIQUIDATION.

Tenders will be received by the undersigned at his office, No. 26 Wellington St., East, Toronto, up to twelve o'clock noon of

TUESDAY, NOVEMBER 27th, 1894,

for the purchase, in one parcel, as a going concern—or for any of the undermentioned divisions—of the assets of the above named Company.

Lot 1.—The Company's extensive iron works, with new foundry, cupola, traveling gear, boilers and engines just erected, twenty acres of land situated at Swansea on the Lake Shore Road, between Parkdale and the Humber River, and 12 rough cast cottages, 2 rough cast boarding houses, 1 brick store erected thereon, valued by the company at.....\$104,100.
Manufacturing Plant, Machinery Plant
Tools, Belting, Fire Service, Stable
Stock, Patterns and Flasks, Factory
and Office Furniture, valued by the
Company at.....\$125,290.

Lot 2.—The stock of manufactured goods, comprising Bolts, Nuts, Rivets, Carriage Hardware, Castings, etc., amounting as per inventory to.....\$41,731.

Lot 3.—Iron, Steel and Wire, per inventory.....\$11,633.

Lot 4.—Scrap Iron, Brass and Copper, per inventory.....\$3,874.

Lot 5.—1½ acres of land lying North of the Company's Works and North of the prolongation West of College St., near Toronto Junction, and close to Hyde Park.

Lot 6.—80 acres of land South of above.

Lot 7.—66 mortgages received in part payment for lots adjoining the above lands, sold by the company, aggregating.....\$38,658.

TERMS OF SALE.

If credit is desired those tendering must state the time required and the nature of the security they propose to give. The credit portion shall bear interest at 5% per annum. One-fourth of the purchase money less the deposit must be paid in cash within thirty days from acceptance of tender. A marked cheque for 5% of the purchase money, payable to the order of the Liquidator, must accompany each tender. These cheques will be returned at once to those whose tenders are not accepted. Conditions of sale and form of tender may be had on application to the undersigned. Plans of the properties and inventories of the other assets, with list of mortgages and full particulars in regard to same, with permits to inspect the works and other assets, on application to the undersigned.

E. R. C. CLARKSON, Liquidator.
SMITH, RAE & GREER,
Solicitors for Liquidator.
Toronto, 17th October, 1894.

Grand Trunk Railway of Canada. SECOND-HAND AND SCRAP STEEL RAILS FOR SALE.

Tenders are invited for about 500 tons of second-hand and Scrap Steel Rails, with Angle Bars or Fish Plates, weight about 65 pounds per yard, in lengths of from 24 to 30 feet. These rails are suitable for relaying, but no guarantee will be given with them.

Also about 500 tons of old Steel Rails considerably worn, but from which can be selected a number of rails good enough for sidings and light traffic.

Height of rails from 4¼ in. to 4½ in., flange about 4 in.

Delivery will be made on cars at any point on the Grand Trunk Company's Line between Island Pond, Vermont and Portland, Maine, inclusive.

Tenders to name price per ton of 2240 pounds. Terms cash on delivery.

Tenders endorsed "Tender for Old Steel Rails," and addressed to the undersigned, will be received on or before Wednesday, October 31st.

L. J. SEARGEANT,
General Manager, Montreal, P. Q.

FOR SALE.

A second hand Heating Fan, 6 x 6 Engine, with one 2500-foot Heater complete. Also about 200 feet Galvanized Iron Flue ready for use.

BINDLEY HARDWARE COMPANY,
Pittsburgh, Pa.

For Sale Very Low.

Foundry and Scale Shop with first-class Plow Patterns and Machinery for finishing Chilled Plow. Property and Machinery in first class repair, on line B. & A. R. R. and N. Y. & Harlem Division. Address

MACY & WILTSE,
Ghent, N. Y.

WANTED.

Second-hand, No. 4 or 5 Stiles Press. Address "E. A.," No. 1027, office of *The Iron Age*, 96-102 Reade St., New York.

Receiver's Public Sale

— OF A —

VALUABLE STEEL MILL, PLANT AND SITE,

KNOWN AS THE

WINDSOR LOCKS STEEL CO.,

Located at Windsor Locks, Ct.

Will be sold at Public Sale, on the premises, on Saturday, November 10th, 1894, at 1 o'clock P. M. This mill is equipped with a 12 in. and 16 in. mill for rolling Merchant Steel, also with a 10 in. mill (not set up). It has a full set of Rolls, Shears, Saws and Machine Tools. A new Steam Plant, consisting of new Water Tube Boilers, Feed Water Heater, Engines, etc., complete; also with new Heating Furnaces and Electric Light Plant and with a Water Power derived from The Connecticut River Water Co., under a lease extending over a period of 999 years, at extremely moderate rates. This is one of the most valuable water privileges in New England. The site consists of 600 ft. of land fronting on the Canal of The Connecticut River Water Co. and with a width of from 150 to 200 feet. It is situated on the line of the N. Y., N. H. & H. R. R. at a point midway between Springfield, Mass. and Hartford, Ct., affording ample freight facilities.

By order of the United States Circuit Court, District of Connecticut.

E. N. SPERRY, Receiver,
United Bank Building, Bridgeport, Conn.

Letters Patent No. 527,668,

Oct. 16th, 1894.

Metallic Tie,—Railroad.

The Patentee, unable to handle, desires to sell at once. Reasonable price. Address

J. C. COWDRICK,
Ogdensburg, New Jersey.

FOR SALE.

About 4000 tons second-hand 58 lb. Steel T Rails, fit to relay, with fastenings to match. Will divide the lot if necessary. Address

JUSTICE COX, Jr., Iron and Steel,
213 So. 4th St., Philadelphia.

A Manufacturing Company

having salesman on the road selling Mechanics' and Machinists' tools and calling on all the large trade as far west as Kansas City and as far south as Louisville, Ky., desire another concern to be represented with them and share expenses, which are not large. Address

BOX 1403,
Springfield, Mass.

Special Notice

to Hardware buyers. You can buy Trowels and other tools too numerous to mention, of superior quality, at prices to suit the times. Address all communications to

CHAS. A. VAUGHN, Manufacturer,
Vineland, N. J.

ATTENTION! Hardware Dealers.

I send free a sample of my Self Selling Wagon Jacks to parties whom I believe write me with a view to handling them. Address

S. S. JOY,
New Market Junction, N. H.

HARDWARE STORE FOR SALE.

One of the oldest established retail Hardware stores in Eastern Indiana, located in county seat of 2500 population, in the center of rich agricultural and manufacturing district. Stock in good condition. Only one other hardware store in town. Will sell reasonably. Address

"L.,"
office of *The Iron Age*, 23 & 24 Pickering Building, Cincinnati, O.

TO LET FOR MANUFACTURING USES.

At South Easton, Pa., on line of Lehigh Valley Railroad and on Lehigh Canal. Sidings in buildings. Electric light. Electric street railway. One main 2-story building, 275 ft. x 45 ft. Steam Engine, Shafting and complete appurtenances for first-class factory or machine shop. One high 1-story building, 80 ft. x 45 ft. Cement floor. One 2-story building, 35 ft. x 45 ft., ground floor suitable for smith shop, etc.

These buildings were erected for galvanizing and barb wire plant, and more recently, for several years, have been in the occupancy of The National Switch & Signal Co. They form part of the plant of The Stewart Wire Co., being separated from its main plant by the Lehigh Canal. Affords a most desirable opportunity for industry using wire in any of its forms and is an exceptionally fine location for manufactory of any character.

Will be let in whole or in part, with or without the adjacent thoroughly equipped and complete Wire Drawing Mill, steam and water power, situated on same side of Canal. For further particulars address

THE STEWART WIRE CO.,
Easton, Pa.

LAKEVIEW, WASHINGTON.

A model manufacturing location. Special inducements offered to manufacturers. Unexcelled facilities for coal and lumber and shipment by rail and water. Eighty ton Iron and Steel Rolling Mill (only one in the State) now being built. Address

THE SOUTH TACOMA COMPANY,
P. O. Box 207, Tacoma, Washington.

To Manufacturers and Hardware Dealers.

FOR SALE.

A NOVELTY in a WEDGE for Axes and Tools with wood handles, in ten sizes. Patented, July 25th, '93. The only wedge on the market. If the handle shrinks the wedge can be driven deeper and the handle cut off flush and it will hold.

ALSO a new invention in SLIDING DOOR LATCHES, patented November 26, '89. These latches are for stable doors and gates. By turning other side up can be used as a straight gate or thumb latch. Can be made as cheap as ordinary latches.

The Wedge and Latches were ILLUSTRATED on pages 56 and 34 of *The Iron Age* of October 18th, 1894. Patents for sale or will take partner with small capital on six patents in the hardware line. Write for samples, etc.,

W. H. THOMAS,
Jenkintown, Pa.

Capital Wanted, \$2000.

Additional capital is required to further increase a small but very successful Steel business. Investment would pay 10% interest, at absolutely no risk. For further particulars apply to "CAPITAL WANTED," office of *The Iron Age*, 96-102 Reade St., New York.

OPPORTUNITY TO SECURE MEX- ICAN TRADE.

A gentleman of large experience in Mexican trade, thoroughly conversant in the language, familiar with the wants of and of extensive personal acquaintance in that country, will return shortly to establish himself permanently in the city of Mexico as the representative of several leading manufacturers of the United States. His syndicate not being quite completed he solicits correspondence from parties desirous of extending their trade to that market. Address "MEXICANO," office of *The Iron Age*, 96-102 Reade Street, New York.

A Hardware Commission House

centrally located in New York City, with ample room for samples and stock and abundance of capital to carry through any agreement or contract which they may make, are open to negotiate with one or two manufacturers of staple lines of hardware or specialties. For further particulars address "FACTORY SELLING AGENTS," office of *The Iron Age*, 96-102 Reade Street, New York.

EUGENE V. N. BISSELL, Auctioneer.
E. BISSELL, SON & CO.,

Successors to
HAYDOCK & BISSELL,
WHOLESALE

HARDWARE AUCTIONEERS,

19 Murray St. and 15 Park Place, N. Y. Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

J. A. COLEMAN,
Author Coleman's Mechanic's Liens in Illinois
Attorney at Law,
82 Hartford Building, Chicago.
MECHANIC'S LIENS EXCLUSIVELY.

HELP WANTED.

Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.

A MAN to do enameling; one who thoroughly understands mixing, lining and firing. Address "ENAMEL," office of *The Iron Age*, 312 The Cuyahoga, Cleveland, O.

SALESMEN ATTENTION.—We offer to salesmen, calling on the iron and wood-working trade, a remunerative line; liberal commissions; references required. Address "COMMISSION," office of *The Iron Age*, 146 Franklin St., Boston, Mass.

SALESMEN for city trade on a SPECIALTY. One for large and jobbing trade, one for retail trade. State experience, references and salary expected. Address "SPECIALTY W.," office of *The Iron Age*, 96-102 Reade St., N. Y.

TRAVELING SALESMAN having an established trade among stove and hardware dealers, and visiting customers every sixty days, can have a fine line of exclusive specialties that will pay right party \$300 monthly; goods are sold from catalogues and photographs. Address, giving references and territory, "BROOKLYN FACTORY," office of *The Iron Age*, 96-102 Reade St., N. Y.

TRAVELING SALESMAN for special territory in every State, visiting the hardware and household goods trade, who will carry our aluminum goods as a side line. Address "MANUFACTURER," office of *The Iron Age*, 59 Dearborn St., Chicago.

A GOOD PARTY to handle first-class wire nail account in Texas; must have had experience. Address "WIRE NAIL," office of *The Iron Age*, 96-102 Reade St., N. Y.

FOREMAN, first-class man, competent to take charge of shop manufacturing edge tools. Address "EDGE TOOLS," office of *The Iron Age*, 96-102 Reade St., N. Y.

A PRACTICAL STEEL FOUNDER; one familiar with the mixture and making of steel castings of different grades; reply with full references and state compensation expected. "STEEL FOUNDER," office of *The Iron Age*, 220 So. 4th Street, Philadelphia.

SITUATIONS WANTED.

Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.

A GAS PRODUCER MAN; 20 years' experience at open hearth and heating furnaces in rolling mills. Address "GAS PRODUCER," office of *The Iron Age*, 96-102 Reade St., N. Y.

A N EXPERIENCED TRAVELING MAN desires position with manufacturing concern to represent them in one or more large cities; best of references. Address "A. J.," No. 1027, office of *The Iron Age*, 96-102 Reade St., New York.

BY A THOROUGH HARDWAREMAN AND TRAVELING SALESMAN, twenty years' experience in store and on the road in all branches of general and builders' hardware, cutlery, guns, etc.; territory now traveling, Indiana, Illinois and Kentucky; have also traveled in other states. Address "L. P. F.," No. 1911, office of *The Iron Age*, 96-102 Reade St., New York.

A COMPETENT, ACTIVE BUSINESS MAN with long experience as a rolling mill manager, wants a position; is well posted in the manufacture of plates, sheets, sections and general merchant bar iron and steel, understands how to turn out good work at lowest cost and is accustomed to purchasing all supplies. Address "R. W. A.," Box 1027, office of *The Iron Age*, 96-102 Reade St., N. Y.

ROLLING MILL.—Wanted, a position as superintendent or assistant; thoroughly posted in mill practice, iron or steel, and economical management of help; pushing and energetic; best of experience in Northern mills. Address "NORTHERN MILLS," office of *The Iron Age*, 96-102 Reade St., New York.

BY AN EXPERIENCED cutlery salesman in the South, two or three additional lines of specialties. Apply at once, "SOUTHERN SALESMAN," office of *The Iron Age*, 96-102 Reade St., New York.

PIG IRON SALESMAN, now with an old established house, desires to make a change; six years' experience in New York and New England; can command some trade and extensive acquaintance with buyers will enable me to introduce brands not now used in above territory; prompt replies only; moderate salary. "PUSHING," office of *The Iron Age*, 96-102 Reade St., New York.

BY A THOROUGHLY experienced hardware and implement man; first-class salesman and stock keeper; can manage store and do the buying if necessary; have had four years' experience on the road; would make contract with a good firm; good references. Address L. W. VIVION, 131 Emma St., Dallas, Texas.

SALESMAN acquainted with jobbing and large retail trade throughout the United States and Canada will be open for engagement after November 1st; experienced in builders' and general hardware; at present in the employ of a prominent lock company; salary and expenses or expenses and commission. Address "CHIPMAN," office of *The Iron Age*, 96-102 Reade St., New York.

YOUNG MAN (34) would like to correspond with first class manufacturing concern, in reference to representing their line in Chicago or elsewhere; six years' experience; references; absolutely reliable; intelligent effort. Box 890, office of *The Iron Age*, 59 Dearborn St., Chicago.

YOUNG SINGLE MAN, with ten years' experience in wholesale and retail hardware business, also some experience as road salesman, wishes to make a change; good reasons for wishing to make change; can furnish good references; desires position as store or road salesman for a good hardware house. Address "K. A. G.," No. 1018, office of *The Iron Age*, 96-102 Reade St., New York.

SUPERINTENDENT OR CHIEF ENGINEER. By mechanical engineer of large and varied experience in hydraulic machinery, structural work in iron and steel, installation of plants, transmission of power, cranes, etc.; thoroughly conversant with modern methods of construction and shop practice. "MODERN METHODS," office of *The Iron Age*, 96-102 Reade St., N. Y.

A N EXPERIENCED SALESMAN with extensive acquaintance among the larger buyers of builders' hardware, calling frequently on the trade in Philadelphia, Pittsburgh, Baltimore and Boston and having office in New York City, as agent for a first-class manufacturer, is anxious to represent an additional company. Address "E. H. W.," No. 1018, office of *The Iron Age*, 96-102 Reade St., N. Y.

OPEN HEARTH STEEL MELTER of 12 years' experience wants position as melter or to take charge of plant; is well up on steel castings, basic and acid processes; married, 34 years old and strictly temperate and can furnish reference from last employer. Address "OPEN HEARTH," 409 Harrison St., Springfield, Ohio.

A S SUPERINTENDENT of any new industry requiring inventive ability to develop and executive ability to successfully manage; would accept a portion of salary in the shape of stock in a small paying business. Address "NEW INDUSTRY," office of *The Iron Age*, 96-102 Reade St., New York.

BRICKLAYER will take charge of rolling mill; has had 15 years' experience building blast furnaces, open hearth and all kinds regenerative furnaces; can work from drawings and posted in the building of all kinds of gas producers; best of references furnished. Address "BRICKLAYER," office of *The Iron Age*, 509 Hamilton Building, Pittsburgh, Pa.

I WISH to secure the agency of some good steel house for the New England States and New York State; must have a first-class tool, also machinery, toe calk, tire steels, etc.; salary \$100 per month and expenses and the concern must agree to make contract for two years or more; can furnish the best of references. Address "S. R. F. STEEL," Melrose, Mass.

A S TRAVELING SALESMAN; prefer heavy hardware; good references. Address Box 10, Pomfret, Conn.

A S FOREMAN in iron foundry, by one who has had a large experience in making all kinds of light and heavy castings in green or dry sand; best of references from last employer. Address "A. D. A.," Box 1011, office of *The Iron Age*, 96-102 Reade St., New York.

A GENTLEMAN of extensive business experience with one of the largest manufacturing concerns in the United States, would like to open correspondence with reliable parties in need of a capable man for position of trust and responsibility; unqualified references can be furnished from former employers and the leading bankers and business houses in the city where he resides. Address "CUSHMAN," No. 1011, office of *The Iron Age*, 96-102 Reade St., New York.

A LIVE ROAD SALESMAN is open for engagement; is well acquainted with the steel and iron trade through Middle and Southern States. Address "ROAD SALESMAN," office of *The Iron Age*, 96-102 Reade St., N. Y.

BY COMPETENT MAN of 20 years' experience as patent furnace builder and producer of patent steel wire, or as superintendent of wire mill; fully competent to hire and manage help; can refer to last place, where I had charge of patenting and wire drawing. Address "FURNACE MAN," office of *The Iron Age*, 96-102 Reade St., New York.

A S MANAGER of Chicago branch of Eastern manufacturing company; have had large experience in machinery, manufacturing and sales department; can give best of references. Address "MANAGER," office of *The Iron Age*, 59 Dearborn St., Chicago.

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AND

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Sixteenth edition; Forty-first Thousand; Four Thousand Testimonials; Richly bound in cloth, price, \$3.00

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"Through the adoption of your system I have effected a saving in my work of at least one-third."—A. B. MUNN, bookkeeper for Miller, Coleman & Co., planing mill and lumber, Scranton, Pa.

"Tis the most complete work I have seen. I strongly recommend it to the accountant, or to anybody who is desirous of mastering the art of bookkeeping. I would not part with the copy now in my possession for \$500, if I did not know where I could procure another copy of the same work."—N. TOMNEY, bookkeeper for Graham, Horn & Co., Vermillion Bay, Ontario, Canada.

"Your book far surpasses my expectations, containing, as it does, so much valuable information."—CHAS. W. SIMMONS, with the Standard Oil Company, Cleveland, Ohio.

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"Am following your directions and have lessened my labor one-half. I admire your system in every respect."—JAMES H. LOVELESS, bookkeeper for C. C. McCarthy, wholesale boots and shoes, Columbus, Ohio.

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TWO PAIRS

WORTHINGTON COMP. COND. PRESS. PUMPS.

14 in.x24½ in.x3½ in.x18 in
ADAPTED TO 2000 LBS.
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COMPLETE WITH CONDENSER. USED BUT LITTLE. DISPLACED BY LARGER ONES.

THE U. S. PROJECTILE CO.,

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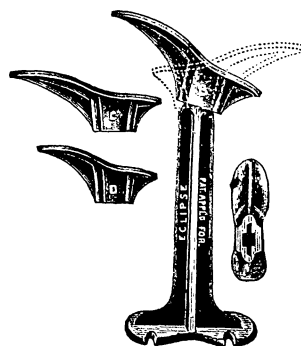
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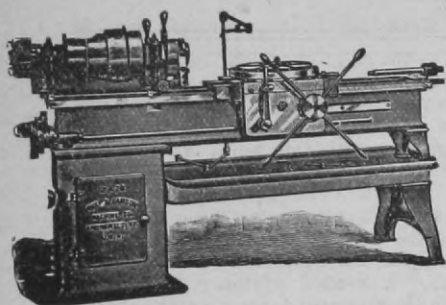
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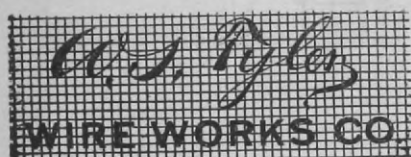
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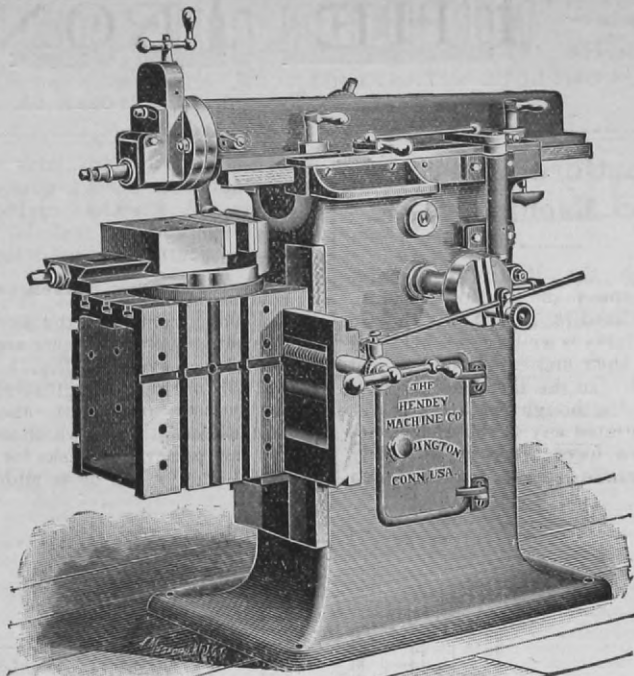
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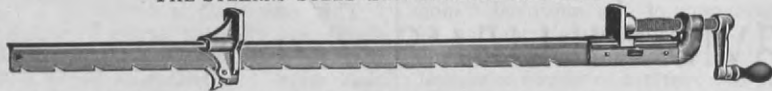
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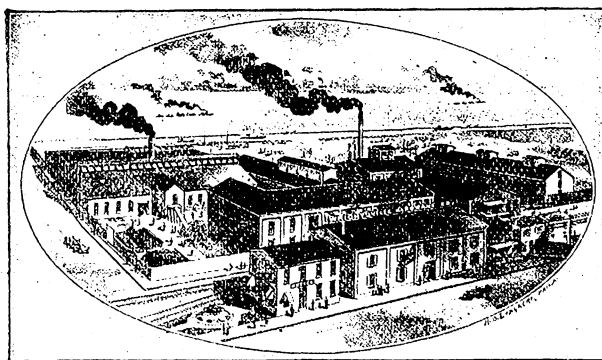
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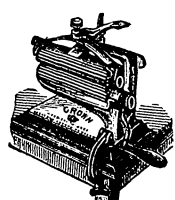
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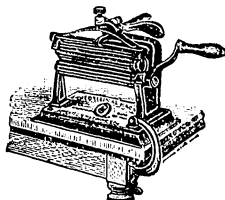
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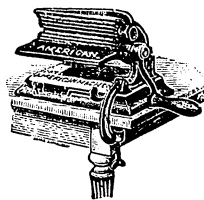
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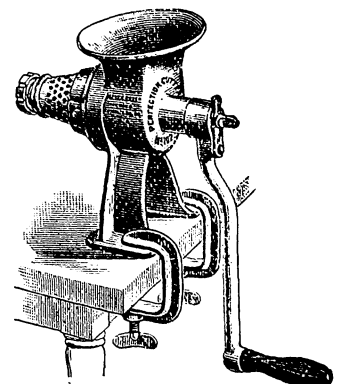
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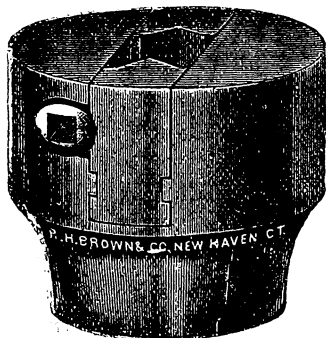
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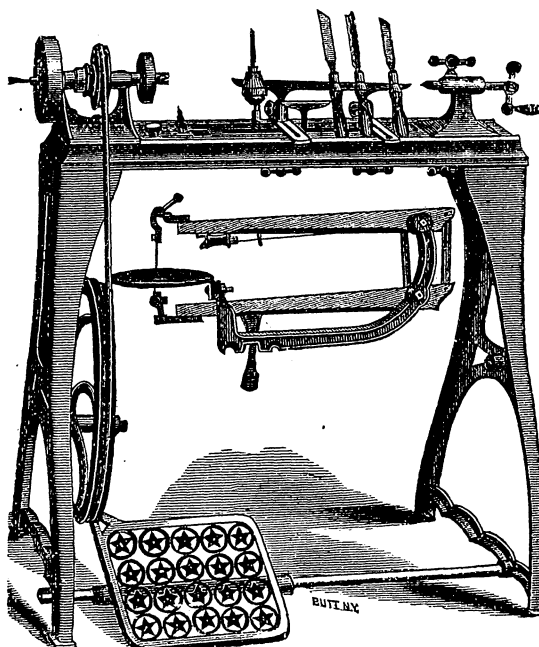
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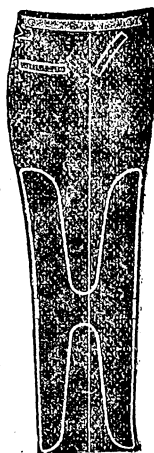
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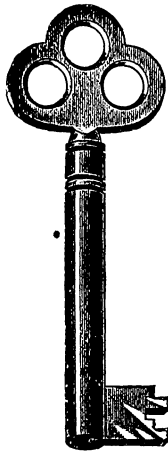
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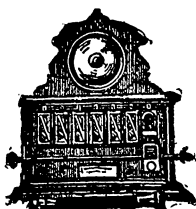
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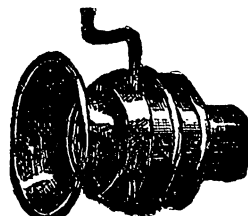


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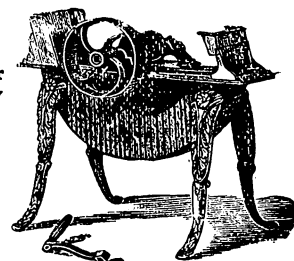
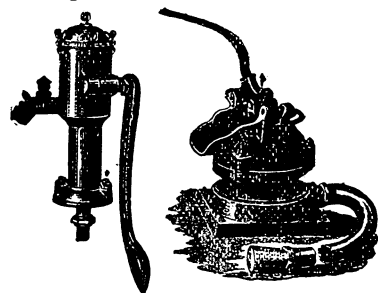
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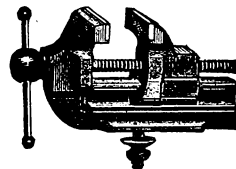
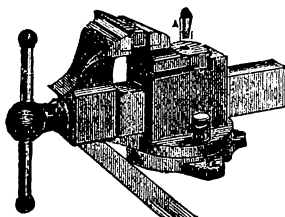
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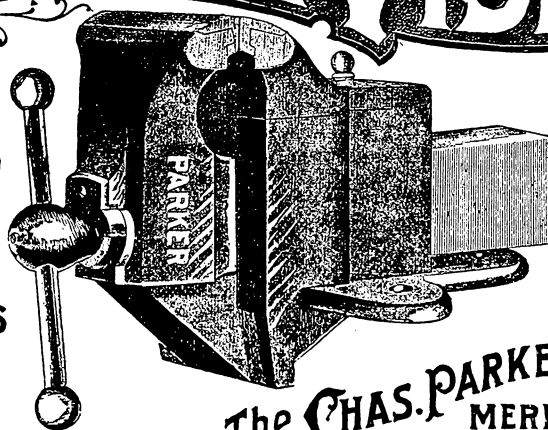
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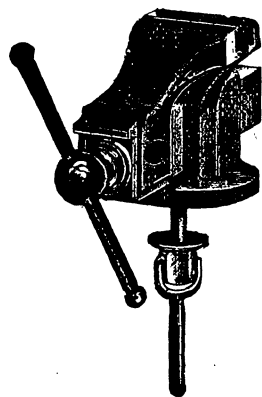
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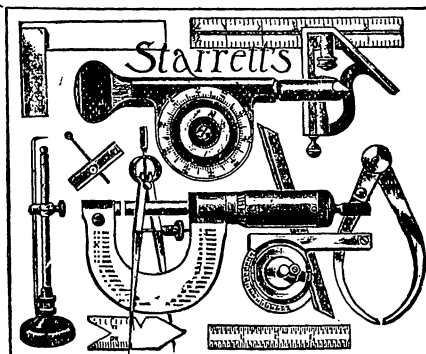
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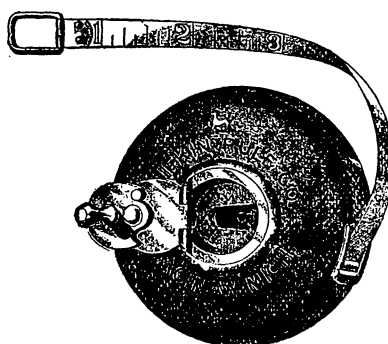


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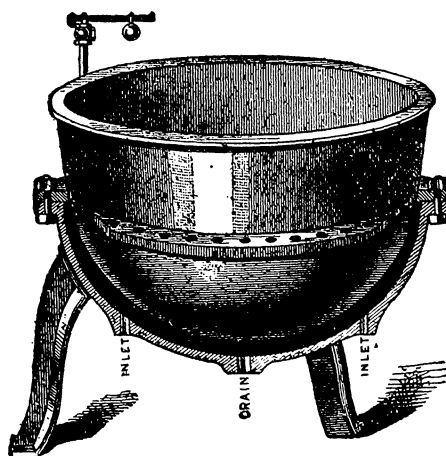
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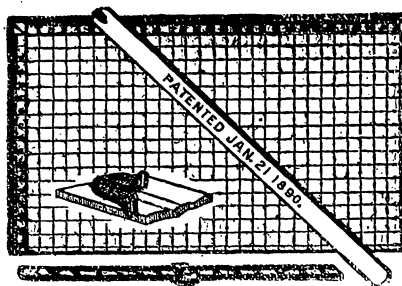


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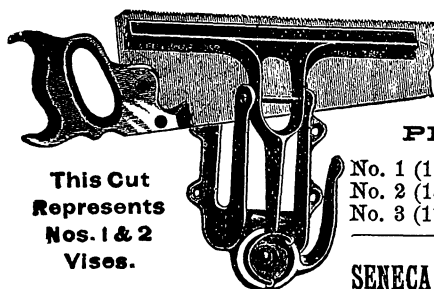
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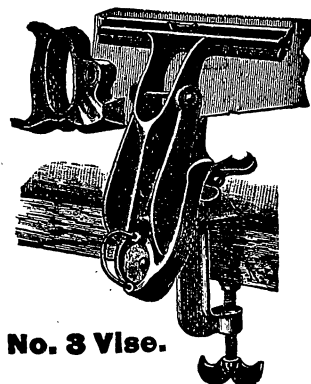
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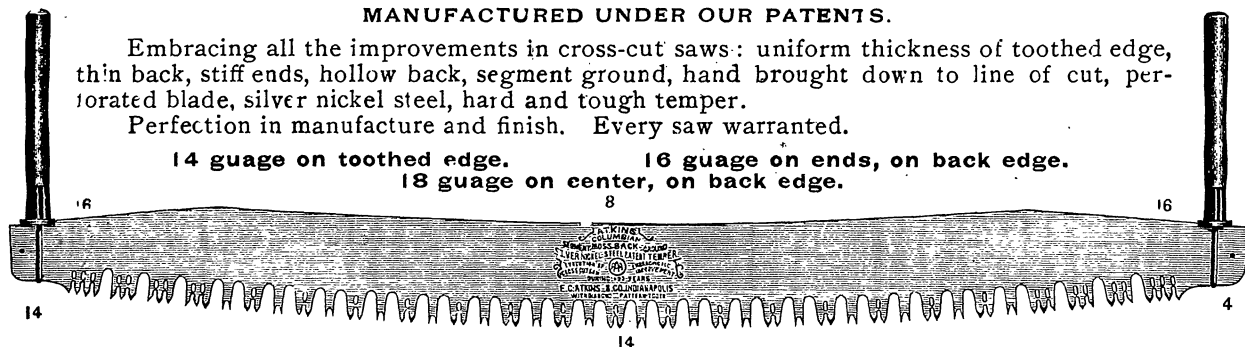
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Perfection in manufacture and finish. Every saw warranted.

14 guage on toothed edge.

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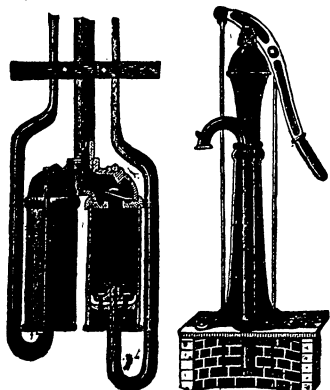
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The toothed edge of the Columbian Saw will remain same thickness until teeth are worn out—on other saws teeth become thinner as they wear out.

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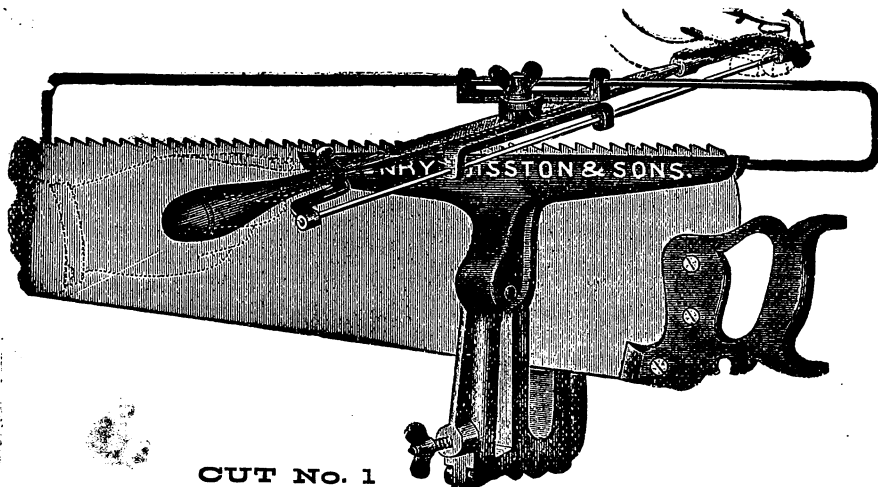
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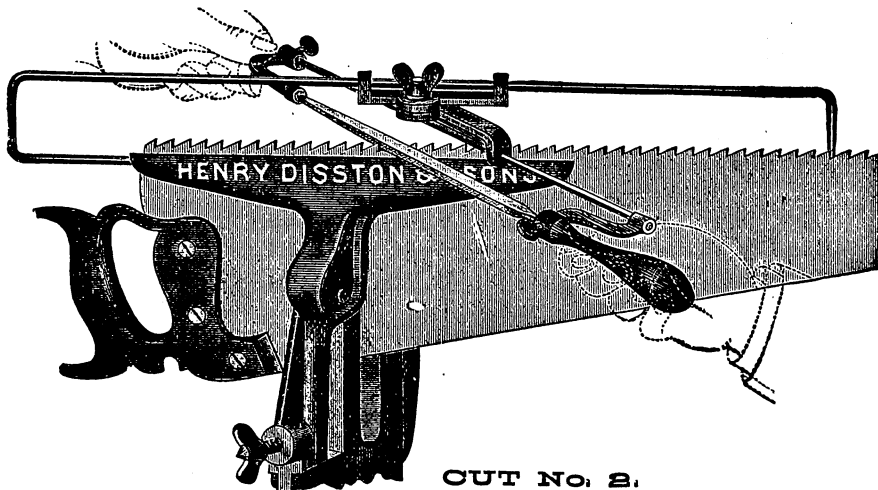
DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
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CUT NO. 1

Cut No. 1 shows a saw and the attachment in proper position for filing the first side, and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT NO. 2.


To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

Write for price including No. 3 Clamp, Filing Guide, File and Handle complete: Packed one in a wooden box.


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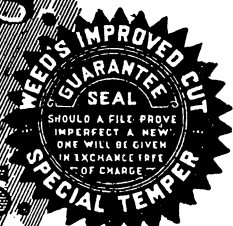
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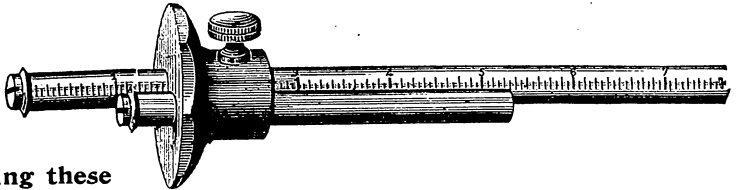


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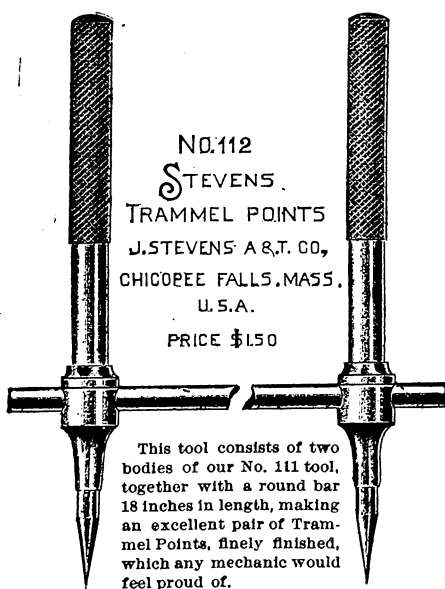
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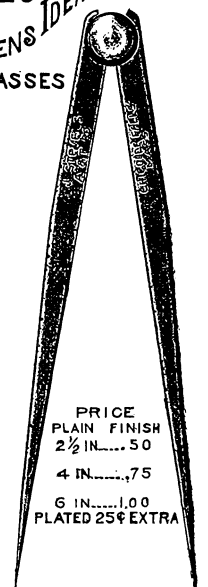
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STEVENS IDEAL
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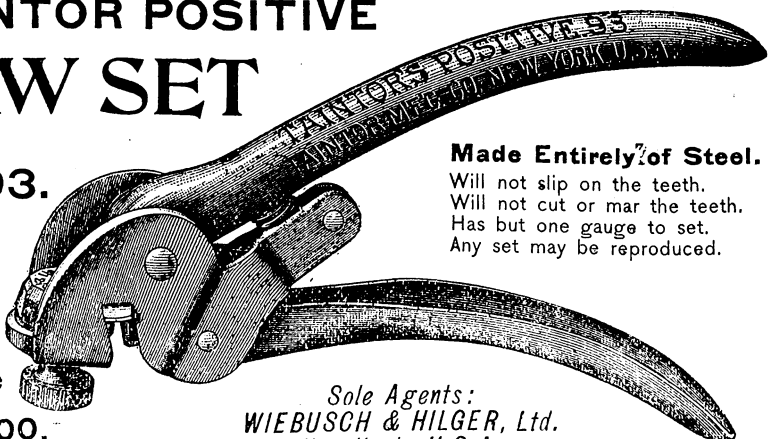
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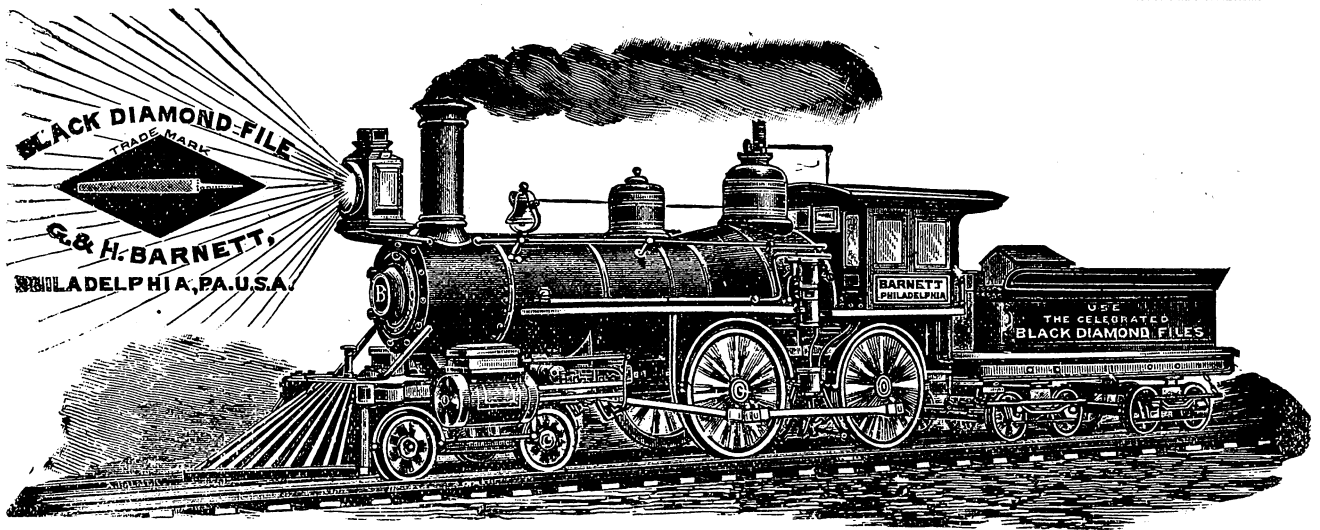
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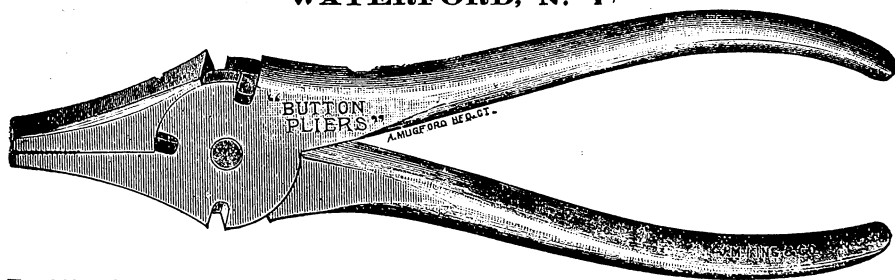
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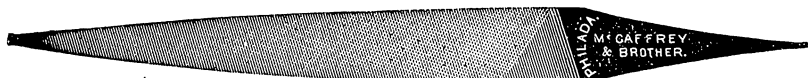
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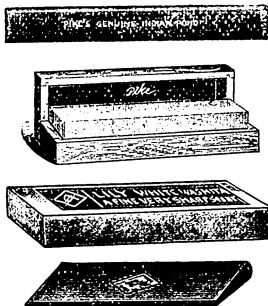
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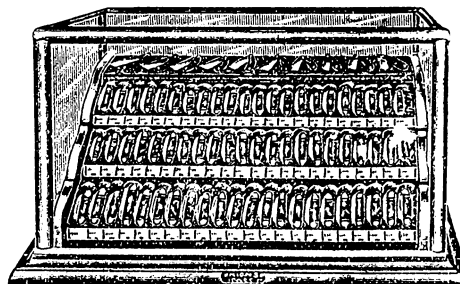
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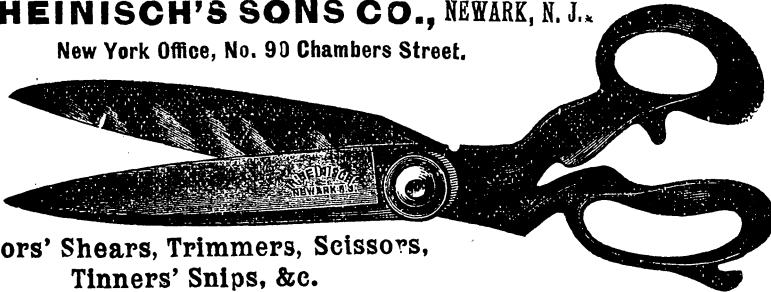
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INCORPORATED, 1892.

New York Office, No. 90 Chambers Street.



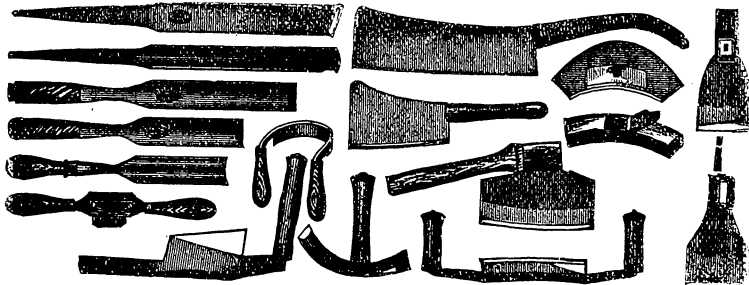
Tailors' Shears, Trimmers, Scissors,
Tinnerns' Snips, &c.

CATALOGUES AND PRICES ON APPLICATION.

We have no contract with Messrs. Hermann Boker & Co. as Agents for the sale of our goods.

HIGHEST AWARD PARIS EXPOSITION, 1889.

ESTABLISHED 1837
INCORPORATED 1892.



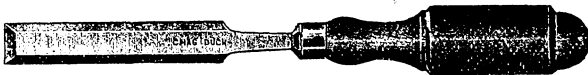
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BUFFALO, N. Y.

MANUFACTURERS
OF
Coopers', Carpenters' and Ship Tools, Plane Irons,
Cleavers, &c. Full Line Chisels.

1853

1894

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CHARLES BUCK,

sole surviving member of the original firm of BUCK BROS., and proprietor of the
MILLBURY EDGE TOOL WORKS, MILLBURY, MASS.
Manufacturer of the

GENUINE STANDARD BUCK TOOLS

All kinds of Shank, Socket Firmer Chisels and Gouges, Cut and Double Irons, S. D. Bits, etc. Send for Catalogue. CAUTION.—Buyers wanting the standard Buck Tools will see that they get only those stamped CHARLES BUCK when ordering from the jobbing houses. Address all correspondence to CHARLES BUCK or the

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RAZORS

Trade-Mark "Charles Buck."

GUARANTEED HAND FORGED AND HAND GROUND.

Any Style or Brand made to order. Facilities "up to date."
Razor Handles, all sizes and styles in stock.

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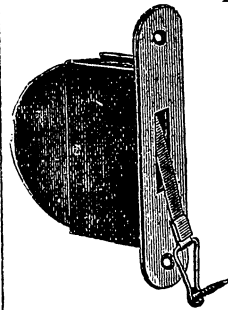
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It seems strange when we say that our business is good and the demand for our **STEEL FRAME SASH BALANCE**

grows every day. We know why: because our Balance is perfect in construction and gives general satisfaction. Ask us for prices and don't confuse ours with the cheaper grades of Cast Iron makes.



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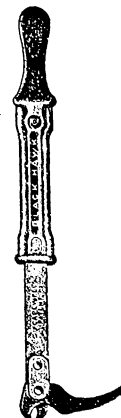
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FOR CATALOGUE & PRICES
THEIR MAKE IS EQUAL
IF NOT SUPERIOR
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HADDAM, CONN.
HAVE BEEN IN BUSINESS SINCE 1840.

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HADDAM, CONN.
HAVE BEEN IN BUSINESS SINCE 1840.

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A Dozen for
Nine Dollars.



The Black
Hawk

Nail
Puller.

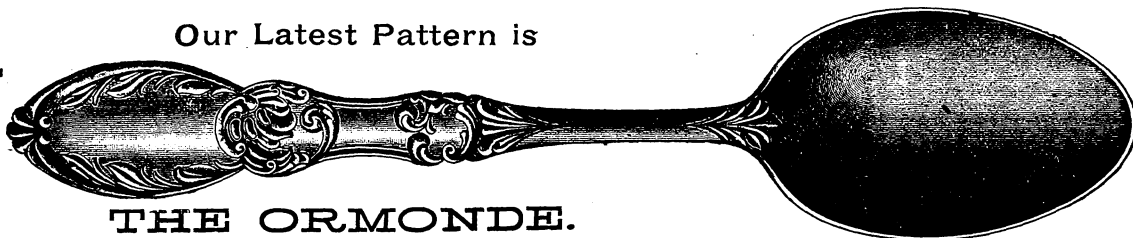
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AMERICAN SPECIALTY CO.,
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The Leader is the SILVER PLATED WARE.



Our Latest Pattern is



THE ORMONDE.

WM. ROGERS MFG. CO.,

Salesroom and Office, Hartford, Conn.

FACTORIES: HARTFORD, CONN., NORWICH, CONN., AND TAUNTON, MASS.

Quality or Price?

Don't sacrifice quality for price. Don't pay too much for quality. You do neither by buying of us. The name of a reliable manufacturer on goods is worth more than it costs.



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folders.

Leader Tea Spoon
FULL SIZE.

THE HOLMES & EDWARDS SILVER CO., - - Bridgeport, Conn.

Send for REVISED CATALOGUE. Every wide awake dealer should have it.

TABLE CUTLERY, BUTCHERS' CARVERS, PLATED GOODS, &c.

NEW YORK

SALESROOM,



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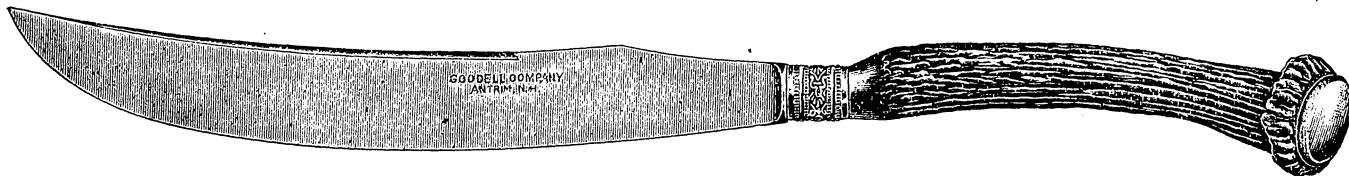
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NORTHAMPTON CUTLERY COMPANY, Manufacturers, Northampton, Mass.

You Make a Mistake

If you delay too long placing orders for

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Our line of Carvers has been very much increased. Prices are low. Goods second to none in finish, and quality as good as they can be made. If ordered now we can ship promptly. We may be able to do so a month hence. For Butcher Knives and Steels, Table Knives and Forks, Shoe Knives, Butter Spades, Can Openers, Kitchen, Bread, Cigar, Putty, Cheese, Hunting, Sticking, Skinning and Boning Knives, ask for "Goodell's" and get goods you can warrant. Sold by jobbers everywhere.

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A practical means of rapidly reaching absolutely accurate results without the mental wear of computing.

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It gives at a glance the net of any sum at a great range of discounts, simple and complex, and it is accurate, rapid and practical. Price, \$3.00; Double Indexed Edition, \$4.00.

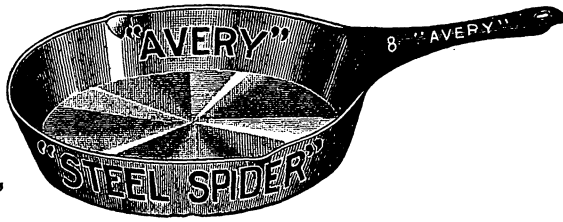
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STEEL

Will Not Warp.

ATTENTION.

Spiders,
Griddles,
Kettles,
Maslins,
Scotch Bowls,
Stew Pots,
Stew Pans,
Etc.,

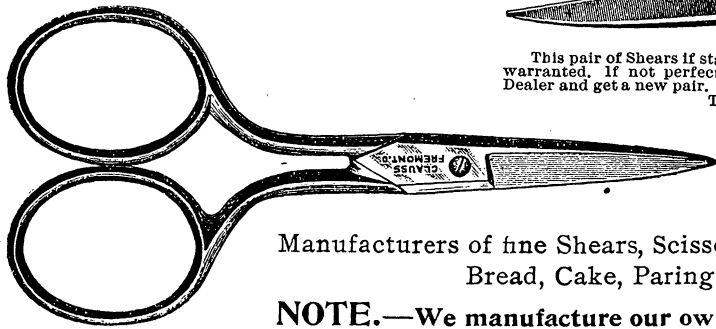


Quick Shipments.
Complete Line.
Perfect Goods.
No Delays.

The Avery Stamping Co.,
Cleveland, O.

Clauss

Fremont, O.



This pair of Shears if stamped "Clauss, Fremont, O." is fully warranted. If not perfectly satisfactory return them to your Dealer and get a new pair.

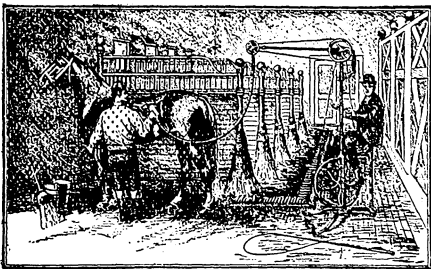
THE CLAUSS SHEAR CO., Fremont, O.

THE CLAUSS SHEAR CO.,

Fremont, O., U. S. A.,

New York Office, 100 Chambers Street,

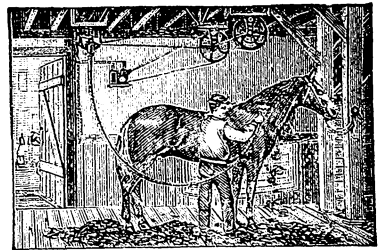
Manufacturers of fine Shears, Scissors, Tinnerns' Snips and The Celebrated Clauss
Bread, Cake, Paring and the Perfect Carving Knives.

NOTE.—We manufacture our own Scissors.**First Prize, Highest Medal of Award, World's Fair, Chicago, Ill., 1893.**

THE CYCLONE CLIPPER.



GILLETTE'S CELEBRATED HAND POWER MACHINE.



"YOKE" CLIPPING MACHINE. OPERATED BY ANY KIND OF POWER.

HEADQUARTERS FOR HORSE CLIPPING MACHINES.

Greatest Variety of Power Horse Clipping Machines in the World.

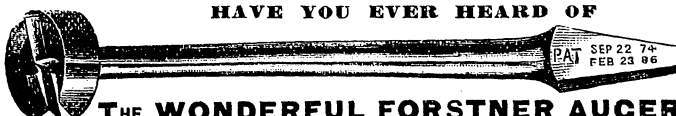
Over 2,700 in use—over 200 in New York City in constant operation. Introduced in the leading Horse Car Stables, Express Companies, Breweries, Dry Goods Houses, &c., in the United States and foreign countries. Send for Catalogue illustrating our machines, prices, &c., just out.

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This is a fac-simile of the label on my **VULCAN TOOL CO.** brand of **HATCHETS**; a brand for which I have a regular trade in some sections, but to those who have not "caught on"—dealers who are handling an outside brand—I offer a limited quantity at a very low price. Inquiries for price solicited.

FAYETTE R. PLUMB, Philadelphia.



If not, it will pay you to send for a sample 4-3 bit and price-list. Sent on receipt of 55 cents. It will bore Round, Oval and Square Holes, and cannot be equalled for fine carpentry, cabinet or pattern work. Discount to dealers on application.

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Stationers' Tin Goods, i. e., Tin Boxes, Etc.

Hardwood Air Tight Cabinets for Cigars.

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Wood Turnings and Enameling.

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ALL STYLES CARRIED IN STOCK. PROMPT SHIPMENTS
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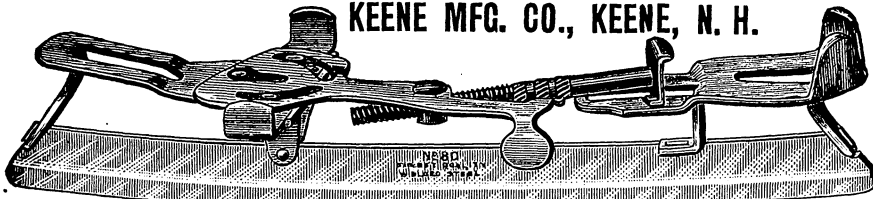
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Every Pair of Our Ice Skates is Put Up in a Pasteboard Box.
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LONG REACH ICE SKATES. Complete Line of Ice Skates, From the Cheapest to the Finest.

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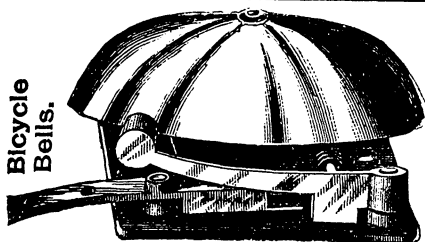
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Minn.

Standart Bros., Detroit, Mich.
Jay A. Rickard, Schenectady, N. Y.
Weed & Co., Buffalo, N. Y.



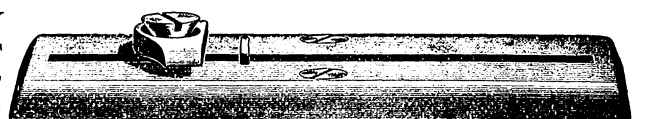
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Bells.

BEVIN BROS. MFG. CO., Easthampton, Conn.,
Manufacturers of

Sleigh Bells, House Tea Hanger, Gong Bells, &c.

This is the "SALEM" HANGER,

A BRAND NEW
ARTICLE OF
"BUILDERS'
HARDWARE,"
AND WE WANT THE HARDWARE TRADE TO WRITE
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Write us for Sample.

The W. A. South Co., Salem, Mass.

HIGHEST AWARD.—WORLD'S COLUMBIAN EXPOSITION.

In EVERY LAND where water freezes the BARNEY & BERRY SKATES are known.

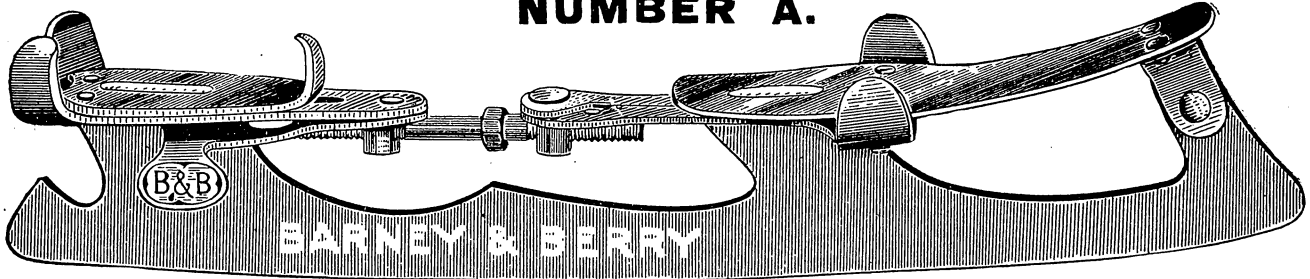
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LEADING JOBBERS

Why not get the BEST?

OF HARDWARE AND
SPORTING GOODS.

BARNEY & BERRY'S

NUMBER A.



Above cut shows the best cheap skate ever offered in the world.

Dealers should examine in comparison before buying another make of inferior quality and workmanship.

THE HIGHER GRADES OF OUR MANUFACTURE ARE TOO WELL KNOWN TO NEED MENTION HERE.

FACTORY AT SPRINGFIELD, MASS.

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Catalogue Free, showing 50 styles and grades of finish.

FOURTH REVISED EDITION.

THE IRON AGE STANDARD HARDWARE LISTS

FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

Saucepans
and Round
Bollers.

Pints.	Plain	Turned.	Third or End.
1	\$0.30	.35	.39
1½	.32	.37	.44
2	.35	.39	.48
3	.42	.47	.56
Quarts.			
2	.50	.56	.63
2½	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
Gallons.			
2	.85	.96	1.31
2½	1.05	1.18	1.56
3	1.20	1.35	1.70

Wrenches. Standard
List.

Inches.	6	8	10	12	15	18	21
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

and inserted in price books, and can be used in connection with any of The Iron Age Hardware Price Books.

That the Standard Hardware Price Lists meet a want of the trade is evident from the fact that a Third edition is already called for.

EVERY HARDWAREMAN SHOULD HAVE A COPY. Price 25 cts.

Stove Hollow Ware.

Ground and
Unground.

POTS, KETTLES, ETC. (CAST IRON.)						
No.....	6	7	8	9	10	11
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75
Kettles.....	.55	.65	.70	.85	1.00	1.40
T Kettles.....	.75	.80	.90	1.00	1.25	....
Spiders.....	.27	.30	.35	.40	.50	.60
Griddles Round	.22	.25	.27	.30	....	....
" Long..	.40	.50	.60	.75	....	....

SCOTCH AND YANKEE BOWLS.

No.....	1	2	3	4	5	6
Scotch Bowls..	\$0.35	.40	.45	.50	.60	.70
Yankee Bowls.	.35	.45	.55	.65	.75	.90

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3½ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out

Glue Pots.

Tinned or
Enameled

No.	4/0....	\$4.50	No.	2	....	\$8.40
	3/0....	5.00		3	....	10.20
	2/0....	5.50		4	....	12.43
	0	6.00		5	....	14.58
	1	6.75		6	....	16.94

Sent, postpaid, on receipt of price, by DAVID WILLIAMS, Publisher, 96-102 Reade Street, New York.



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In Your Business or at the Range?

If you deal in ARMS or AMMUNITION or shoot a Rifle, Pistol or Shot Gun, you will make a HIT by sending for the IDEAL HAND BOOK.

IDEAL MFG. CO., New Haven, Ct., U. S. A.

Please mention *The Iron Age* when you write.



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are built to please the dealer and rider.

Are you in the bicycle business? If not, you can make it pay to handle Clippers. Buy direct from the manufacturer and save the jobbers' profit. It will add considerable to your bank account. We want responsible dealers only. We may be able to interest you, in fact we are sure of it. Our policy is a protective one, and will please you. It protects against Scalpers and "Curb Stone Brokers."

Grand Rapids Cycle Co.

GRAND RAPIDS, MICH.

SKATE GRINDING MACHINERY.

A complete line. Write for prices of the

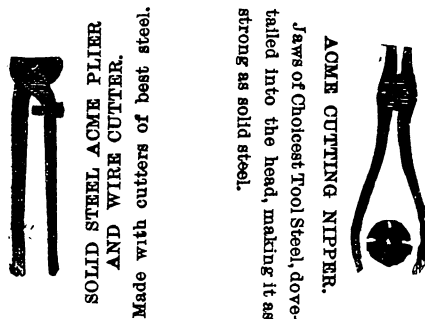
Keenedge Skate Grinder

and Skate Holder.

Charles Perkins, - Bridgewater, Mass
Special discount to the Hardware Trade.

ACME CUTTING TOOLS.

Made in all Sizes.



SOLID STEEL ACME PLIER
AND WIRE CUTTER.
Made with cutters of best steel.

ACME CUTTING NIPPER.
Jaws of Choicest Tool Steel, dovetailed into the head, making it as strong as solid steel.

HIGGANUM HARDWARE CO., HIGGANUM, CONN.

New York Office, 18 Cliff Street.

JOHN LOYD,



Machine Knives, Shear Blades,
Presses and Dies.

Nos. 558 to 562 Water Street, New York

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Washbourn & Moen Mfg. Co.'s Wire Rope.

Boston Belting Co.'s Rubber Goods.

Alexander Bros.' Oak Tanned Belting.

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The Samuel Winslow Skate Mfg. Co.'s Ice Skates.

Chicago Emery Wheels.

Black Diamond Files.

Russell & Erwin's Screws.

P. & F. Corbins Builders' Hardware.

Landers, Frary & Clark's Table Cutlery.

Geneva Tool Co.'s Agricultural Tools.

Write us for Prices.

THE W. BINGHAM CO., 146, 148 & 150 Water St., Cleveland, Ohio.
97 & 99 Superior St.,

THE CRAWFORD MFG. CO.

MAKERS OF

HIGH GRADE AND JUVENILE

BICYCLES,

FACTORY, HAGERSTOWN, MD.

NEW YORK OFFICE, 72 READE STREET. L. B. Whymper, Mgr.

DIRECTIONS FOR USING

WILLIAMSON'S NEW POWER CORK SCREWS.

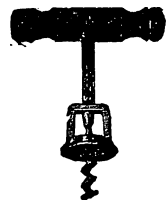
KEEP ON TURNING, DO NOT PULL.

No. 1243, Nickel Plated, Apple Wood Handle, \$5.00 per dozen.
" 1443, " Rosewood " 5.50 " "

For Discounts and Prices of other styles send for Catalogue.

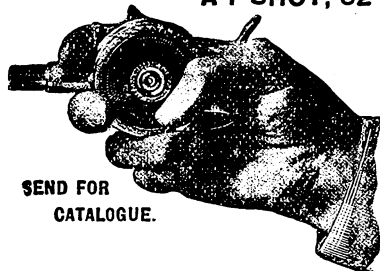
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Manufacturers of Wire Specialties for the Trade



THE NEW "PROTECTOR" REVOLVER

A 7-SHOT, 32 CALIBRE, STANDARD CARTRIDGES.



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QUICK! DURABLE!
COMPACT! EFFECTIVE!

The most Genteel and Serviceable Rapid Firing Revolver ever manufactured. Carried in the vest pocket as easily as a watch. Absolutely Safe! Automatic Safety Lock! An Ideal Weapon for a man to carry. Selling by the Thousand. Elegantly Finished, Neatly Packed in a Box, Price \$6.00. Ask your Dealer for them or send to us.

CHICAGO FIRE ARMS CO., 637-638 Monadnock Building, CHICAGO, ILL.

Schoverling, Daly & Gales,

302 Broadway, New York,

GUN DEALERS.

(Every Variety of Sporting Goods.)

We desire to send our Fall Catalogue to all legitimate dealers carrying sporting goods in stock.

THE WHITELY EXERCISER

A Complete Home Gymnasium

MADE OF ELASTIC CORD RUNNING OVER

NOISELESS CONE BEARING PULLEYS

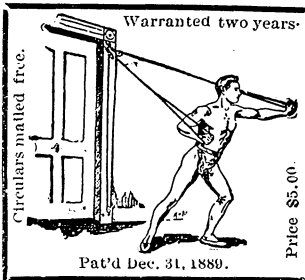
RESISTANCE SELF ADJUSTING.

RECOMMENDED BY ALL PHYSICIANS.

DEMAND CREATED BY THE MANUFACTURERS.

Liberal Discount to Dealers.

— MANUFACTURED ONLY BY —



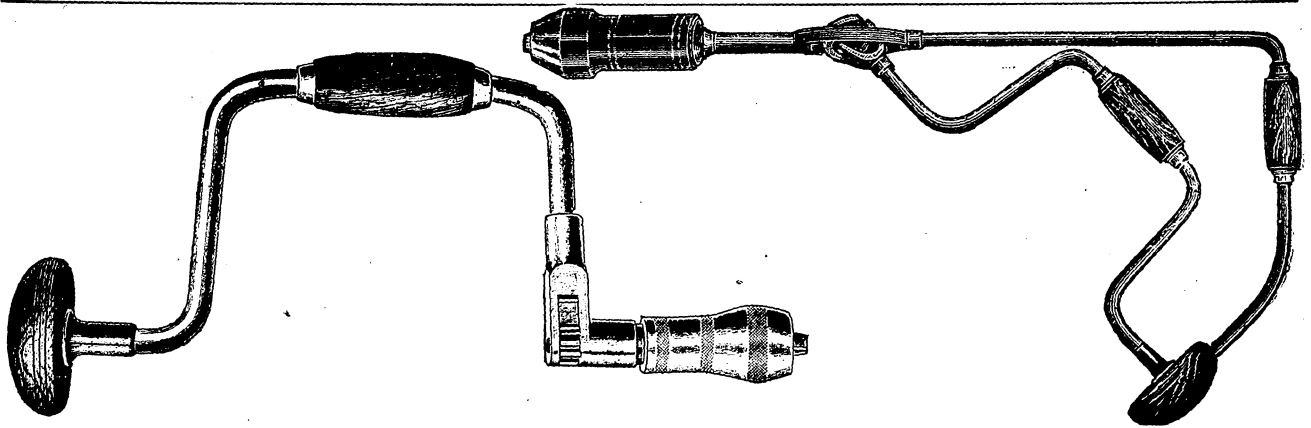
Warranted two years.

Circulars mailed free.

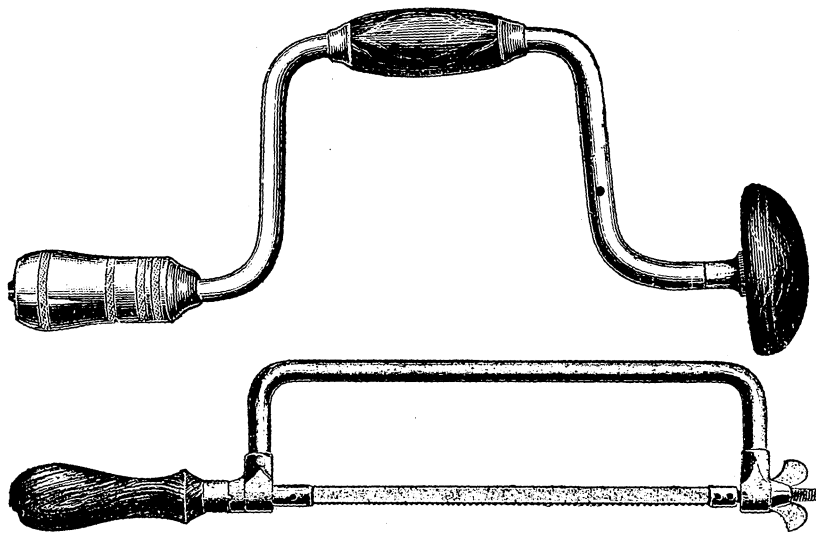
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Price \$5.00. "Health and Strength," 64 pages, illustrated. Mailed for 10c.

THE INDEPENDENT ELECTRIC CO., 39th St. and Stewart Ave., CHICAGO, U. S. A.



The
Amidon
Tool Corporation,
Manufacturers of
Bit Braces
and



Hack Saw
Frames
in all styles
and sizes.

P. O. Box 1042.

Sole Agents, JOHN H. GRAHAM & CO., 113 Chambers St., New York.

Warranted Better than the Best ENGLISH ANVIL

Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of hardest temper, and never to come off or "settle." Horn of tough *untampered steel*, never to break or bend. *Only Anvil made in the United States fully warranted as above.*

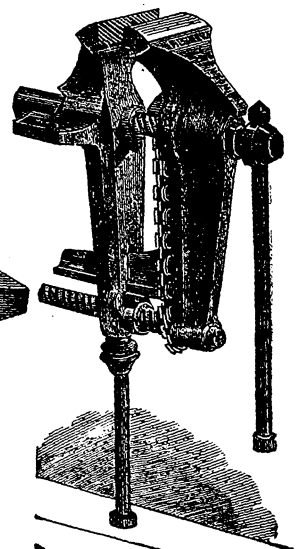
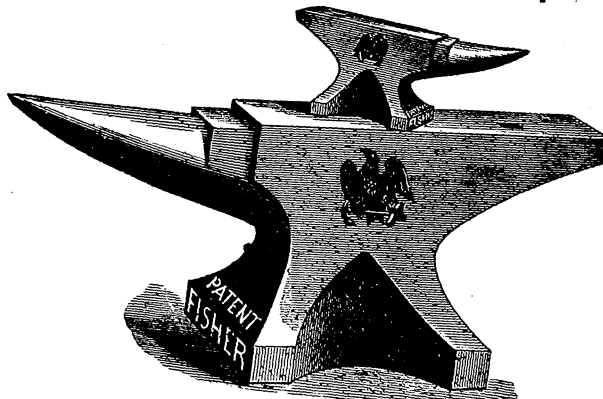
FISHER DOUBLE-SCREW VISE

IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for all heavy work. ACCURATE AND DURABLE. Send for Circular.

ESTABLISHED 1843.
MORE THAN 200 DIFFERENT PATTERNS.

None Genuine without our Trade-Mark.

EAGLE and "FISHER" Stamp.



EAGLE ANVIL WORKS,

Trenton, N. J.

Sold in New York by our Agents, J. C. McCarty & Co., 97 Chambers St., The Russell & Erwin Mfg. Co., 45 Chambers St.

MERK CHRISTMAS TREE HOLDER !

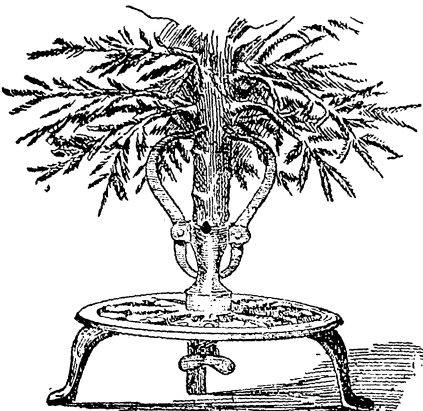
PATENTED SEPT. 1st, 1891.

BUY THE BEST.

Christmas comes but once a year

If you want to make your home pleasant and cheerful during the holidays BUY A MERK CHRISTMAS TREE HOLDER. Made of iron, neatly finished in gold bronze or japanned, a great improvement over any heretofore made. By an ingenious contrivance the tree is held secure by strong arms which extend upward from the main body of the receptacle in which it is placed. If desired the tree can be revolved. Sample tree holders sent by express prepaid upon receipt of \$1. Packed in quarter and half dozen crates for shipment. Manufactured and sold only by the ALLENTOWN HARDWARE WORKS, ALLENTOWN, PA.

SOMETHING NEW.—Hardware dealers and others are requested to write for descriptive circulars and wholesale prices.



Electric Motor Construction for Amateurs.

By C. D. PARKHURST.

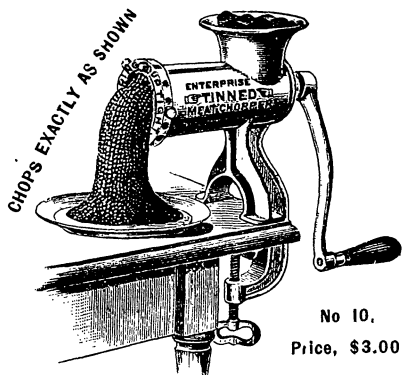
Gives directions and working drawings for making an electric motor to run sewing machines, small lathes, etc., with rules for constructing the battery to furnish the electrical current, and much practical relative information.

A table indicating the difference in wire gauges is included.

Price, \$1.00.

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"ENTERPRISE" MEAT CHOPPER.

No 10.
Price, \$3.00.

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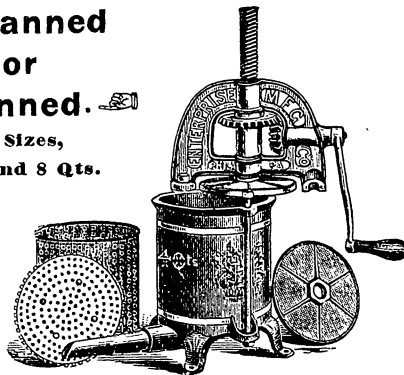
"ENTERPRISE" STUFFER and LARD PRESS.

Japanned

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3 Sizes,
2, 4 and 8 Qts.



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FREE.

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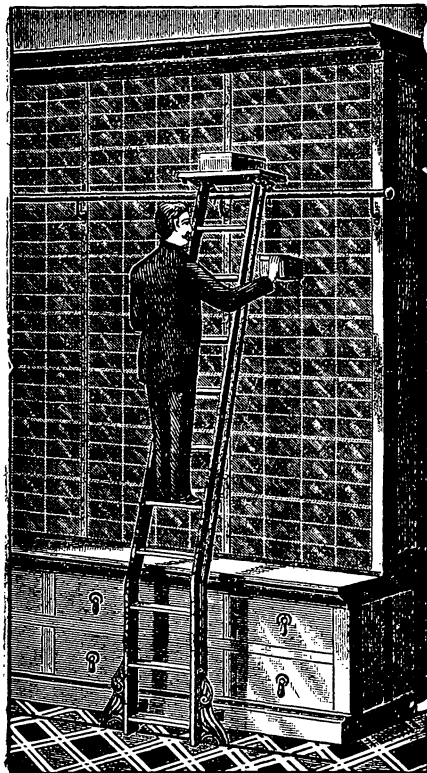
Third and Dauphin Sts., Philada., Pa.

New York Branch, J. C. McCarty & Co., 97 Chambers St., New York.

For Sale by the
HARDWARE
TRADE

THE BICYCLE STEP LADDER.

Especially adapted for Hardware Stores.

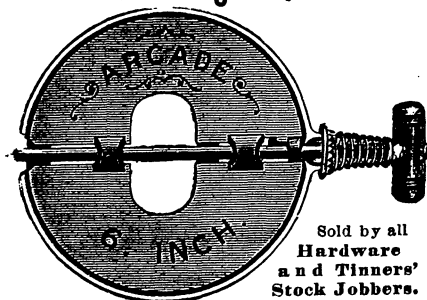


The newest, neatest, simplest, easiest operated and safest store ladder made. Highest Award World's Fair. Write us.

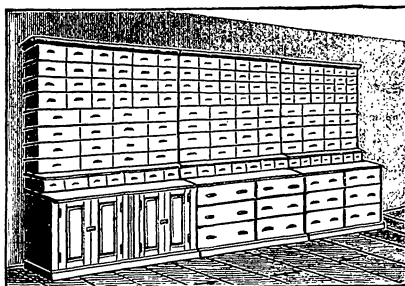
The Bicycle Step Ladder Co., 50 State Street,
Chicago, Ills.

N. Y. Agency, E. J. HUSSEY & CO., 80 John St.

Made by **Arcade Mfg. Co.,** Freeport, Ill.



Sold by all
Hardware
and Tinner's
Stock Jobbers.

**HARDWARE
DRAWERS.**

**THE WERNICKE SYSTEM
OF STORE FIXTURES.**

It is new, novel and unequalled for beauty
convenience and economy.

Send for Descriptive Circulars.

THE WERNICKE CO.,

Manufacturers of General Store, Bank and Office Furniture,

No. 125 WILDER STREET,

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We can fill orders on the day
they are received for

BUHL TUBULAR HEADLIGHTS

No. 15 New Side Lift Lanterns.

No. 20 Buhl Top " "

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**The Celebrated Buhl Dash
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Every Buhl Lantern is tested before it
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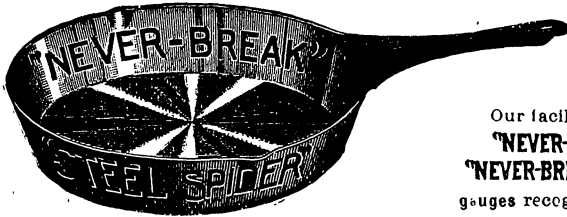
Winslow Skate Mfg. Co.

Union Steel Screw Co.

Eagle File Co.

American Shear Co. Knives.

Fall Catalogue No. 8 issued early in September.



"NEVER-BREAK" Steelware.

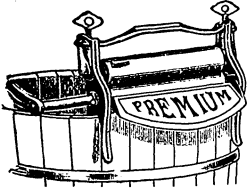
The "STANDARD" for Weight, Finish and Price

Our facilities are such that we can make immediate shipments.

"NEVER-BREAK" Spiders and Griddles are all made of 14 Stubbs' English Gauge and all "NEVER-BREAK" Kettles and other deep ware of 16 Stubbs' English Gauge. These are the only gauges recognized by the United States Government and the trade as "Standard."

THE BRONSON SUPPLY CO.,
NEW YORK AND CLEVELAND.

Steel Spiders, Griddles, Kettles, Maslins, Scotch Bowls, etc. Send for Catalogue and Discounts.



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MANUFACTURERS OF THE

Premium Wringer,

With Automatic Apron Adjustment.

SURPLESS, DUNN & ALDER, Direct Representatives,

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No. 3

Globe Street Lamp.

Light your Streets and Driveways.

The S. G. & L. CO.

Tubular Globe Street Lamp

IS THE Best Street Lamp Manufactured.
Equal to the best Gas Light.
Will not Blow Out in the Strongest Wind.
Will not Smoke.
Will not Freeze.
Automatic Extinguisher.
Outside Wick Regulator.
Will Burn Four Hours for One Cent.

MANUFACTURED BY

STEAM GAUGE AND LANTERN CO.,

SYRACUSE, N. Y.

Western Branch, 25 Lake St., Chicago, Ill.

The Wonderful "New Process" Oil Heater.

THE HEATING PROBLEM SOLVED AT A SMALL COST.

The "New Process" (Coal) Oil Heater will comfortably heat a room twenty feet square, in cold weather. Is intended for use in Bed-rooms, Bath-rooms, Dining-rooms, Offices, Summer Resorts and all places where a moderate heat is required, without a flue connection.

We use with it our mammoth Globe-Incandescent lamp, with a special attachment on spreader, which, with the drum, can readily be removed, the spreader changed, the glass chimney placed in position and the Heater is converted into our 300 candle-power Globe-Incandescent lamp, the best in the world.

The "Heater" is very handsome. Brass fount, nickel trimmed, Russia drum, with ornamental top which can be removed, to use the grate on top for cooking.

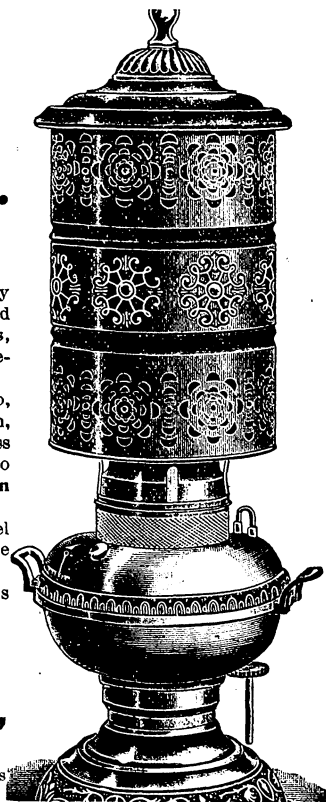
No soot! No smoke! No odor! Construction of parts simple. Made with reference to being easily kept clean.

Comfort! Convenience! Economy!

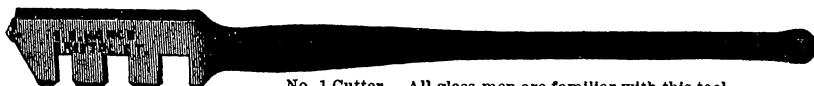
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The Standard Lighting Co.,
CLEVELAND, OHIO.

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MONCE'S NOVELTY GLASS CUTTERS. — INTERCHANGEABLE LOCK STENCILS



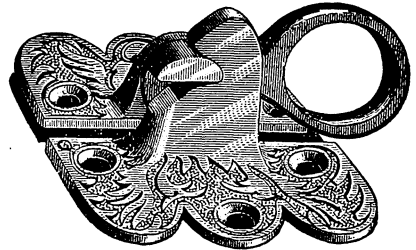
No. 1 Cutter. All glass men are familiar with this tool.

S. G. MONCE, BRISTOL, CONN.

"CONROY"
Refrigerator Door Fasteners

Have rapidly supplanted all others.

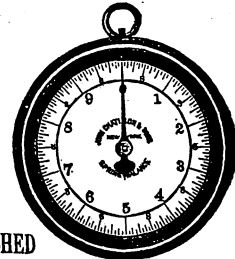
Refrigerator Trimmings.



P. J. CONROY & CO., Paschall, PHILADELPHIA.

John Chatillon & Sons,

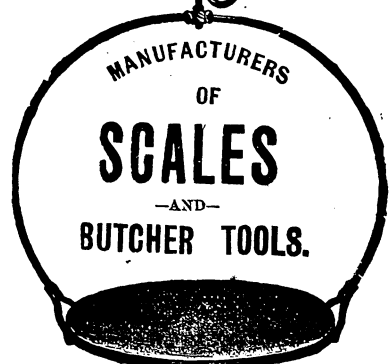
85, 87, 89, 91, 93 CLIFF ST., NEW YORK.



ESTABLISHED

1835.

SEND FOR
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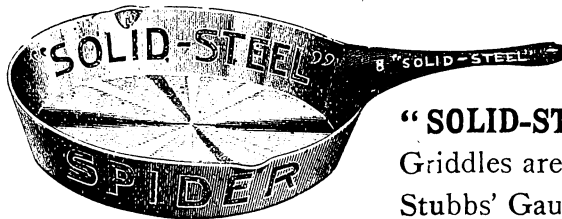
Sole Agents for
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John Chatillon & Sons, N. Y.

WE MAKE

SPIDERS,
GRIDDLES,
KETTLES,
SCOTCH BOWLS,
MASLINS,
STEW PANS,
STEW POTS,
BROILERS,
&c., &c.



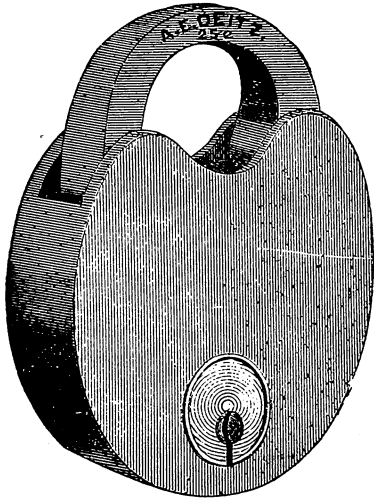
teed not to warp.

"SOLID-STEEL" Spiders and Griddles are pressed *HOT* from 14 Stubbs' Gauge Steel and guaranteed not to warp.

THE CLEVELAND STAMPING & TOOL CO.,
CLEVELAND, OHIO.

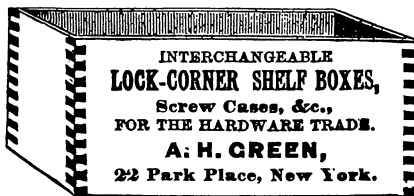
Light and Heavy Stamping and Blanking Dies and Presses.

A. E. DEITZ



J. C. McCARTY & CO., Agents,
87 Chambers and 81 Reade Sts., New York.

Factory, **BROOKLYN, E. D. N. Y.**



"It Will Take the Chill
Off a Cold Room."

THE ROCHESTER PARLOR HEATER.

Mr. Russell Sage, the well known New York banker, has bought a good many lamps of us, and Mr. Sage is not given to buying or recommending articles without merit. This is what he says of The Rochester Parlor Heater:



NEW YORK, Sept. 24, 1894.
The Rochester Lamp Co.,
42 Park Place, New York.

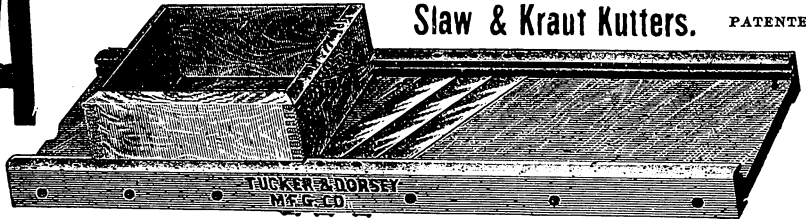
Gentlemen—I take pleasure in saying a few words of praise of your little "Rochester Parlor Heater." I have two of them—one in my house in the city, and the other in my country home at Cedarhurst, L. I. I consider it the prettiest, cleanest and most useful heater for taking the chill off a cold room I have ever seen, and for general convenience in the house it is unapproachable. My experience with use of the "Heater" has caused me to recommend it to others, and I am happy to say that I have been thanked over and over again for recommending it, as it was "just what was wanted." I commend it as a useful, ornamental and economical "Heater" that will be sure to give satisfaction.

Respectfully yours, **RUSSELL SAGE.**

THE ROCHESTER LAMP CO.,
42 Park Place,
37 Barclay Street, } New York.

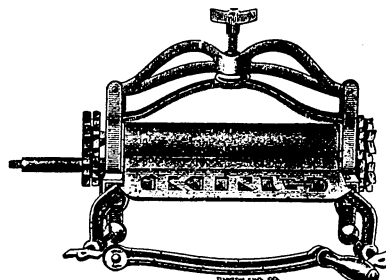
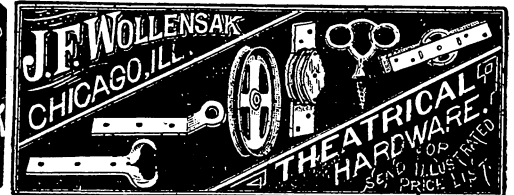
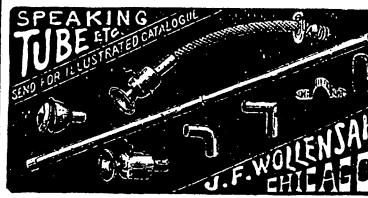
ADJUSTABLE KNIFE

Slaw & Kraut Cutters. PATENTED.



A line that leads them all. Get our new prices.

Tucker & Dorsey Mfg. Co., Indianapolis, Ind.



**We are Sole Manufacturers of the
Celebrated Erie and King Wringers.**

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

THE NATIONAL WRINGER CO., CANTON, OHIO.
New York Office, 107 Chambers St., John T. Ryan, Mgr.



Dangler Electric Torches

FOR
GASOLINE
OR
OIL

14 JETS OF LIGHT

3 to 6
INCHES
LONG.

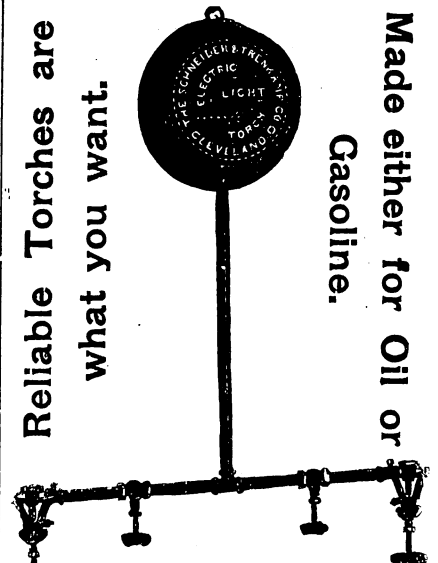
FOR lighting manufacturing establishments, such as Rolling Mills, Foundries, Machine Shops, Engine Rooms, &c., &c., with a convenient, portable, brilliant, steady light, and by cheaper means than by Coal Gas.

SOLE MANUFACTURERS,

The Dangler Stove & Mfg. Co.,
Cleveland, Ohio.

Reliable Torches are
what you want.

Made either for Oil or
Gasoline.



These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner. Write us for prices. A liberal discount given to the trade. Manufactured by **THE SCHNEIDER & TRENKAMP CO.** Nos. 479 to 497 Case Ave., Cleveland, Ohio.

IMPROVED EDITION OF THE IRON AGE HARDWARE PRICE BOOKS.

Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

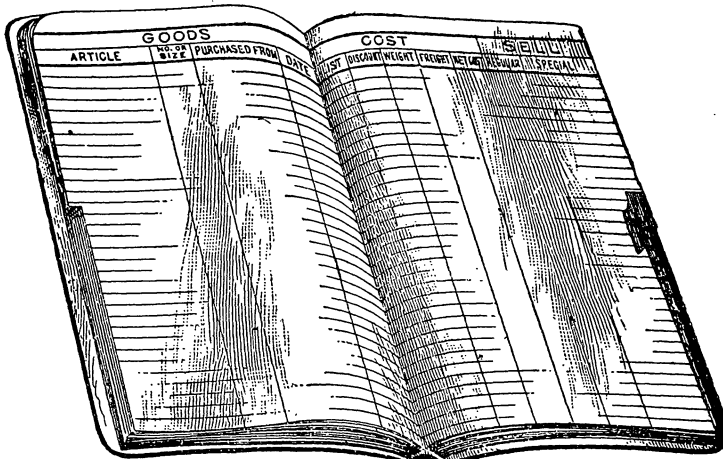
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price, or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

A, 200 pages, - - - - -	\$1.00
A F, 200 pages with flap, - - - - -	1.25
A 2, 400 pages, - - - - -	1.50
A F 2, 400 pages with flap, - - - - -	1.75



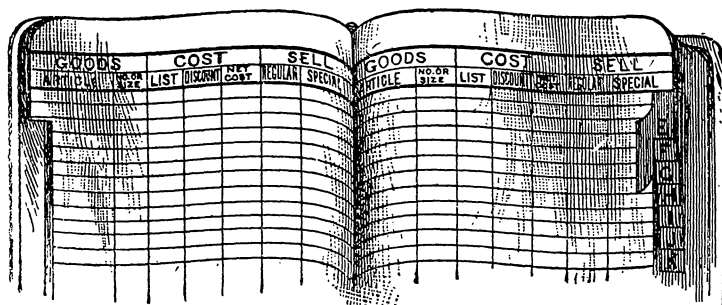
Hardware Price Book A.

In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

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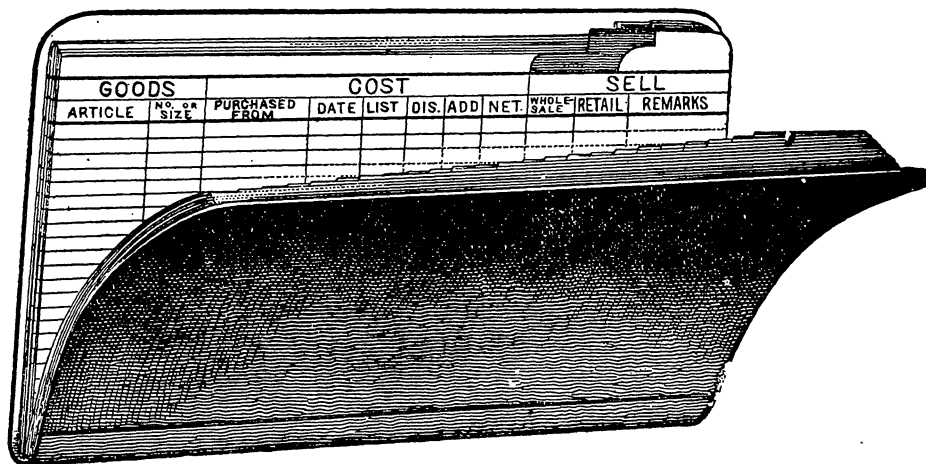
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

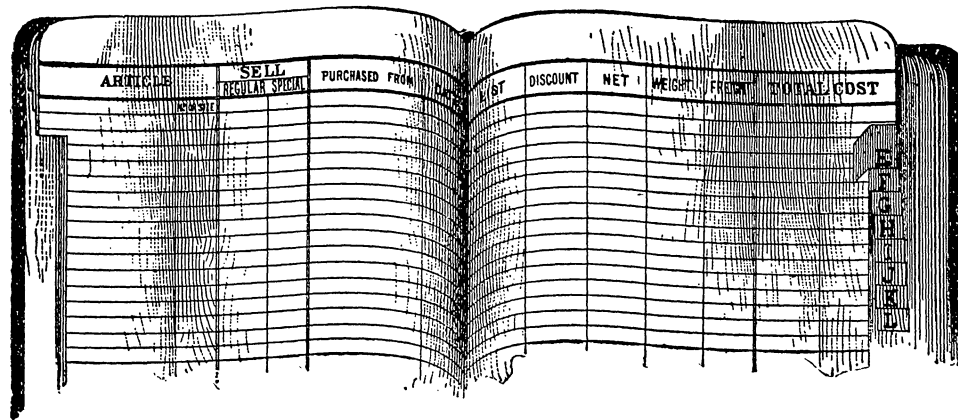
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Hardware Price Book C.



Hardware Price Book D.

Arrangement is adapted to the requirements of the trade in this direction.

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FOUR EDITIONS.	D, 200 pages, - - - - -	\$2.00	D 2, 400 pages, - - - - -	\$3.00
	D F, 200 pages, with flap, - - - - -	2.50	D F 2, 400 pages, with flap, - - - - -	3.50

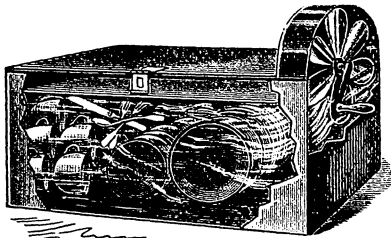
Price Book D will recommend itself particularly for desk and store use, and for salesmen on the road.

The name of the article, its number or size and the selling price are the first to meet the eye on the left-hand page, as embodying information desired when the selling price is required. The other headings follow in convenient order, by which a detailed memorandum regarding the goods may be kept, the whole being seen at a glance. A number of pages at the back of the book are arranged for memoranda, which will be found a great convenience. This arrangement

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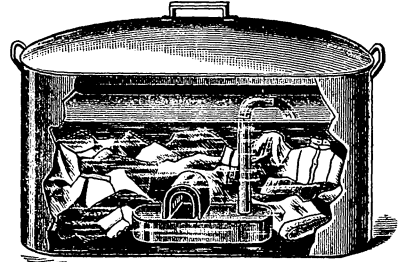
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 1 Burner \$1; 2 B., \$1.50;
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Steam Clothes Washer.

Our Irons and Stoves Save 80% of Gas.

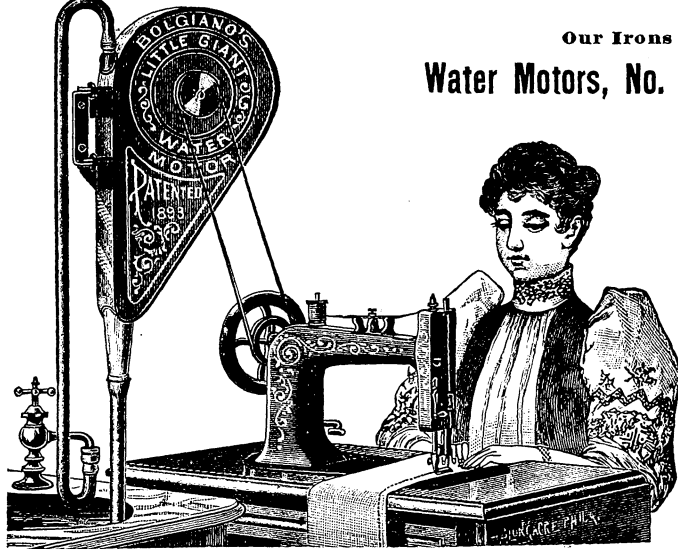
Water Motors, No. 1, \$5; No. 2 \$10; No. 3, \$15.

Clothes Washers,
50c.

Dish Washers,
\$5.

Kitchen O d o r
Consumer, \$1.

Dough Mixer, \$3.



Little Giant Water Motor No. 1.

The
 Bolgiano
 Mfg. Co.

BALTIMORE,

MARYLAND.



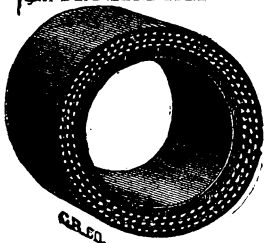
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Over Two Million Feet

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GARDEN HOSE

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 single piece complained of,
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Who Has Not Had Bad Hose?

Who has not lost time, patience, money, by attempting settlement for such goods?

THE CAUSE in nine cases out of ten is the lapped seam.
 THE REMEDY is in buying our

PATENT SEAMLESS TUBE HOSE,

made by machinery, the tube run like lead pipe, through a die. There is no lapped tube, no seam, no cracks, no defects; water cannot get through to rot the duck and cause the hose to burst.

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Order a Sample Bale of our Seamless-Tube Hose—Best in the World, costs no more than ordinary lapped-seam hose. The different colors, Red, White, Black, Green and Yellow, make a fine window or sidewalk attraction.

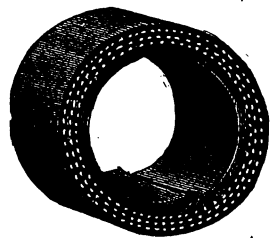
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of the Mechanical Rubber Co.,

CLEVELAND, O.

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OLD LAPPED TUBE



We were awarded an order for
 25,000 ft. for World's Fair
 of our celebrated

Seamless-Tube
 COTTON RUBBER-LINED HOSE

We Want Your Trade.
 Send for 60-page Catalogue.
 Write for Prices and Samples.

N. R. STREETER & CO.,

Manufacturers of **SAD IRONS AND HARDWARE.**



"SENSIBLE" MINCING KNIVES.

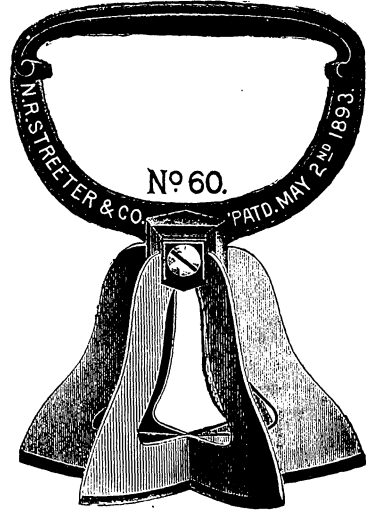
Tempered Steel Nickel-Plated Blades.
Multiple-Bladed Means Rapid Cutting.

**These goods have become the
standard of the market.**

Our line of Sensible Mincing Knives
covers all points where other Multiple-
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BLADES can be **REMOVED** when they
need sharpening. Easy to clean.

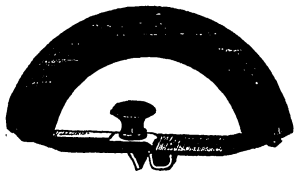
Write for our 1894 Catalogue
and get our Prices.



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General Office, Groton, N. Y.

N. Y. Office, W. H. JACOBUS, 90 Chambers St.



PATENT APPLIED FOR.
The Steel Stretcher Handle,
for Mrs. Potts' Sad Irons,
in Hazel Wood only.
No. 110.

The Cleveland Wood Turning Co.,
710-726 Scranton Ave., Cleveland, O.

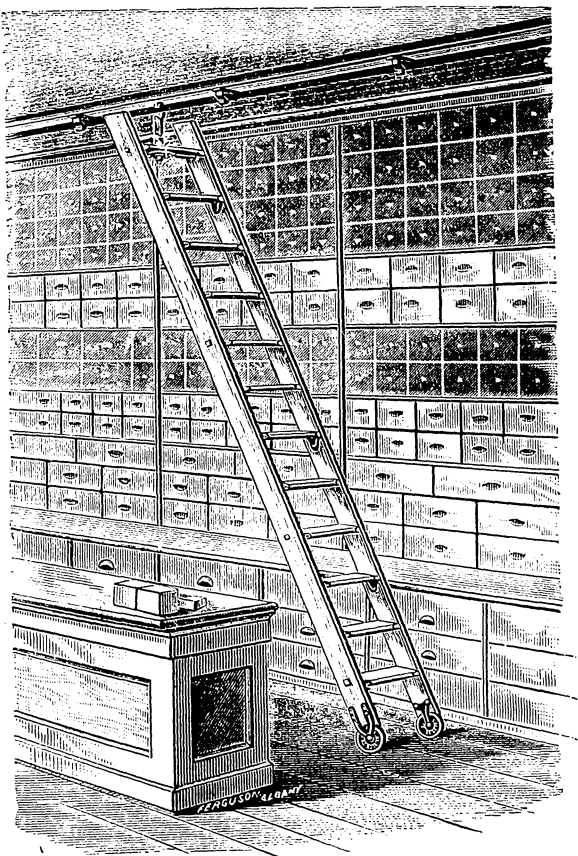
Special work in Handles and Wood Turning of all
kinds. Our line of regular made Tool Handles is the
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New York Office:
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Walnut, Tinned, No. 2.
Hazel, Japanned, No. 10.
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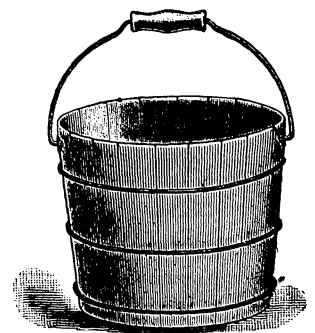
THE "NOISELESS" STORE LADDER.



The latest and best. Perfectly noiseless. Neat in ap-
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Manufactured by
M. CROISSANT,
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ELECTRIC-WELDED Wire-Hoop Cedar Pail.



Pat. March 24th, 1891,
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Made of best selected **Virginia
White Cedar.** Hoops are rust proof,
are sunk in grooves, and are **twice** as
strong as old style flat hoop. **Impos-
sible** for this pail to fall down. Write
for prices and catalogue.

Richmond Cedar Works
Manufacturers of Woodenware,
RICHMOND, VA.

Patent Carrying Track System or OVERHEAD TRAMWAY.

For use in Mills, Foundries, Machine Shops, Paper and
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A safe, practical and labor-saving overhead system for moving all kinds of merchandise to any part of a mill or factory. No possible chance for wheels to get out or off the track. With the single and double switches and curves the loads can be easily propelled in any direction desired, and having a central hanging, an even motion is obtained.

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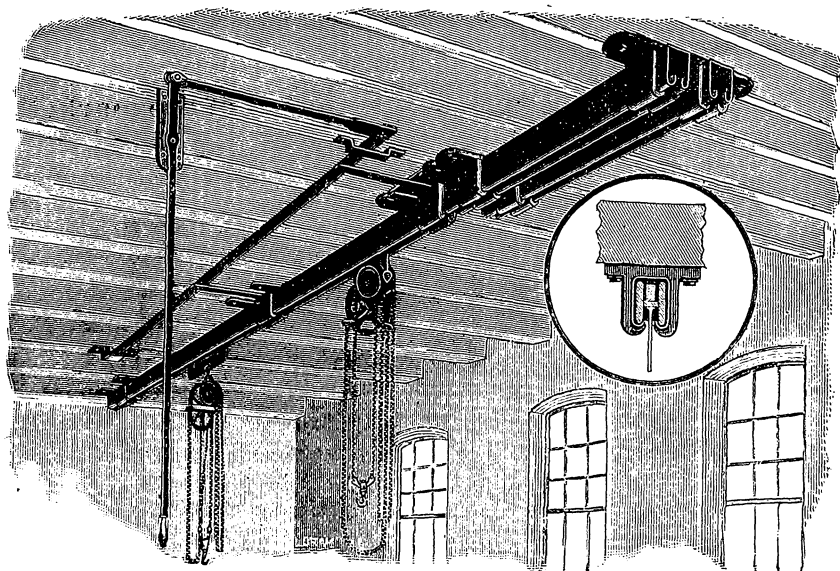
PARLOR
BARN
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Door Hangers

AND

A LINE
OF

Store Ladders.



COBURN TROLLEY TRACK MFG. CO., - - HOLYOKE, MASS.

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Write for Prices and Circulars.
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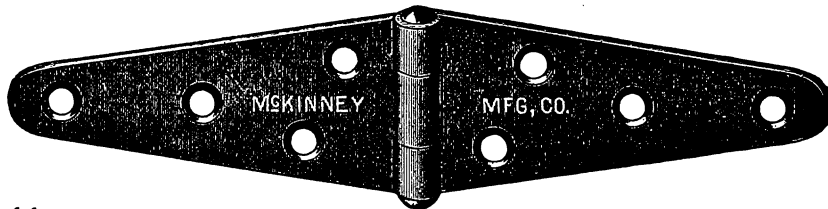
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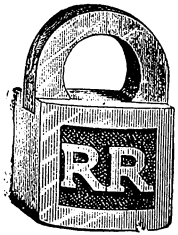
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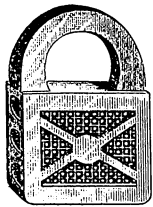


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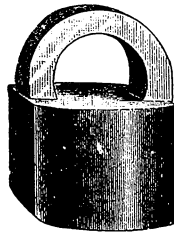
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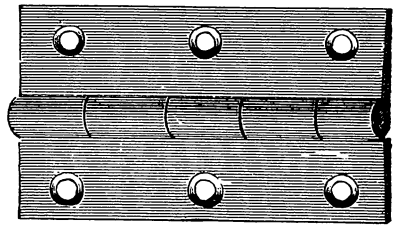
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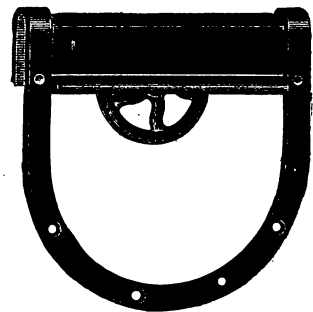
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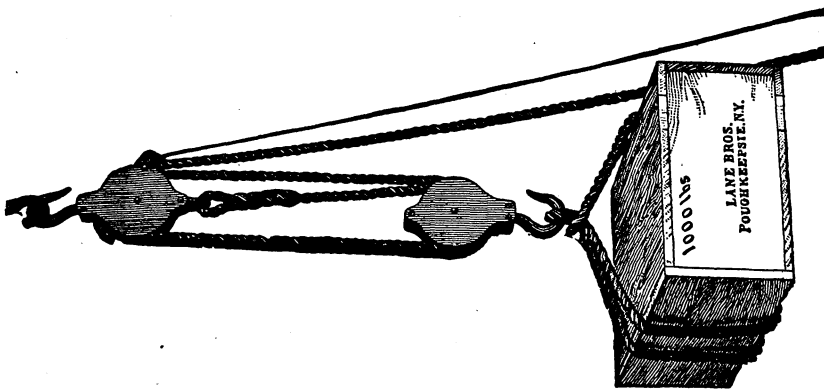
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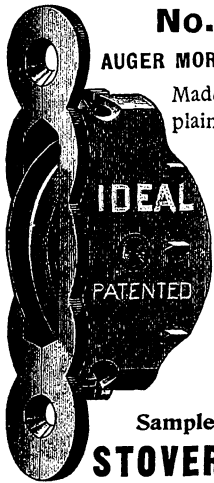
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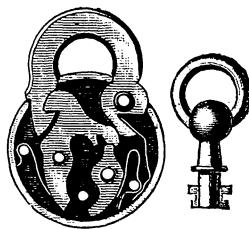
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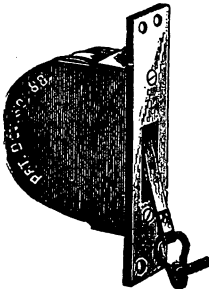
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Eight Tumblers. Key turns both ways

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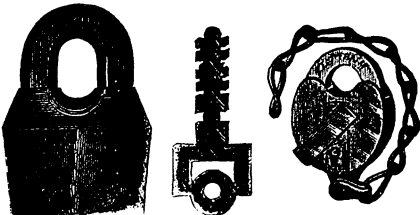
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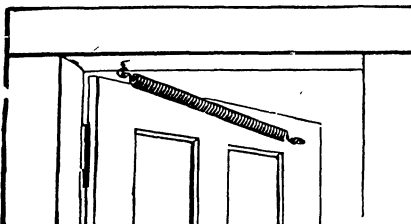
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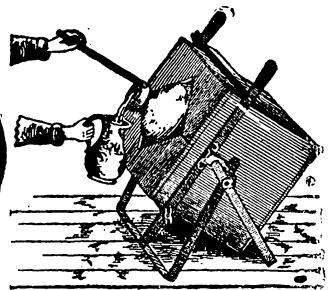
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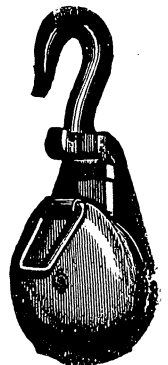
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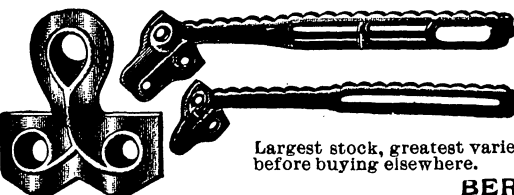
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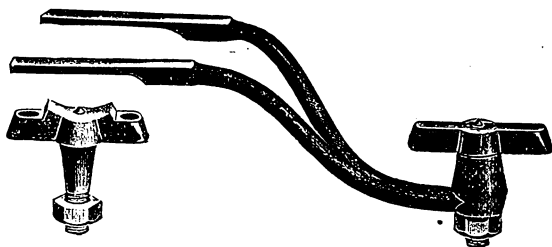
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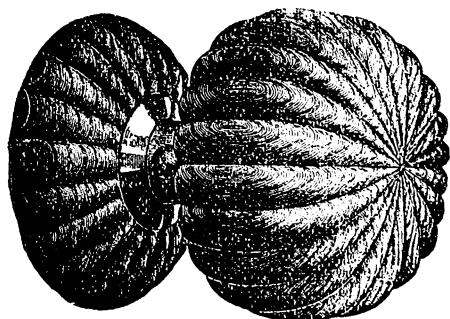
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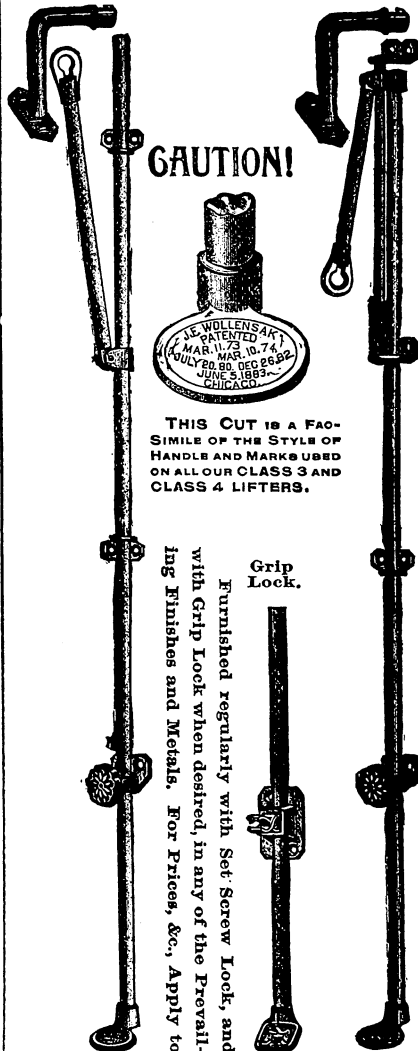
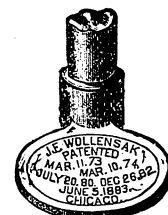
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We would also call your attention to our improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities, use sand or borax in welding on the Calk and cool off at a dark, or still better, cool off without plunging in water.

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No. 1, 15 more shoes to the keg.

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" " "

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" " "

And other sizes in proportion.

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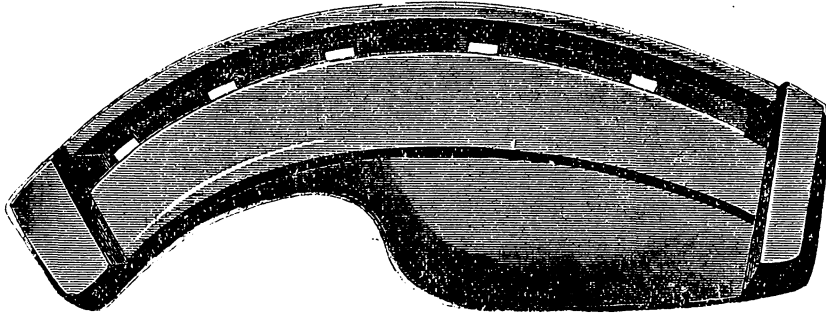
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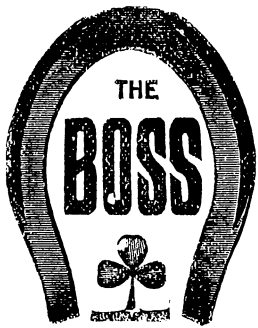
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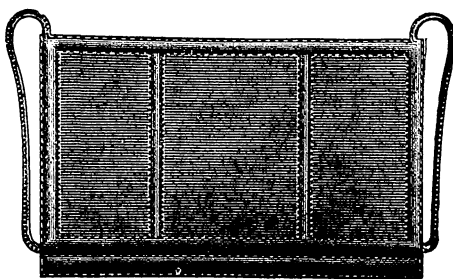
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Of Best Material and Workmanship.

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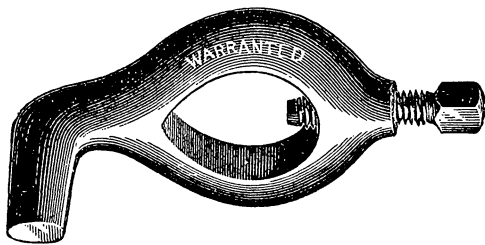
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Carriage Forgings
Of every description. Also Special Forgings.

E. D. CLAPP MFG. CO., Auburn, N. Y.

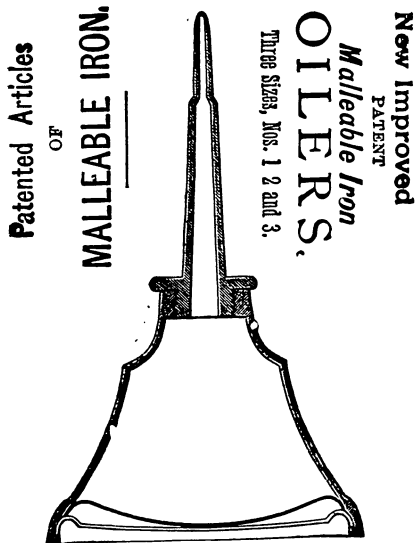
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Strongest in the market.

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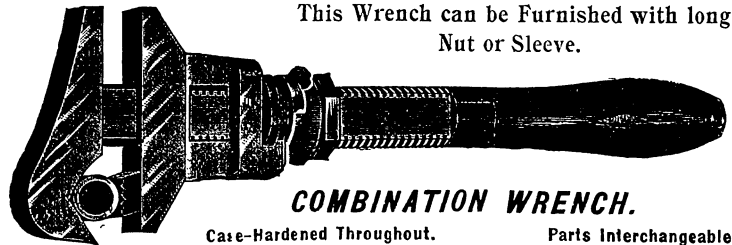
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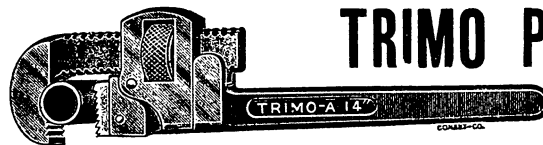
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Case-Hardened Throughout.

Parts Interchangeable

This wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the
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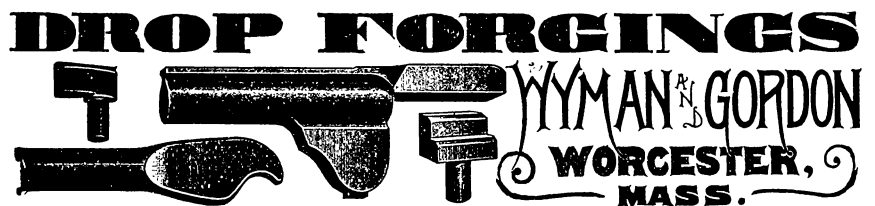
TRIMO GIANT WRENCH.

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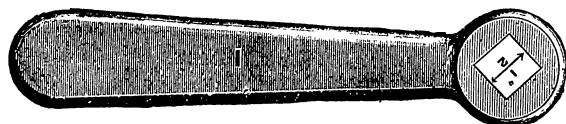
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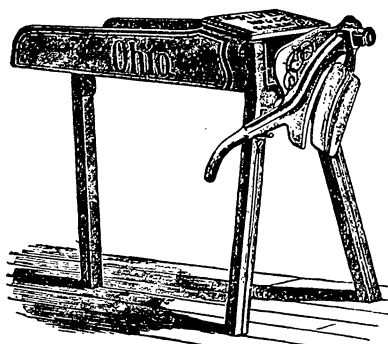
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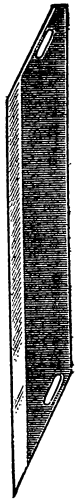
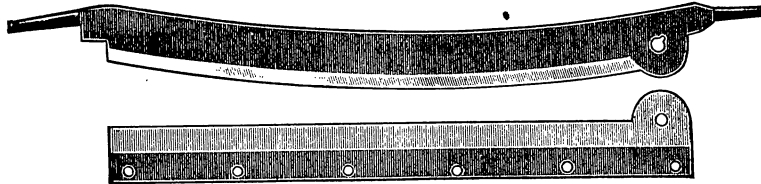
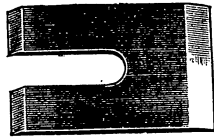
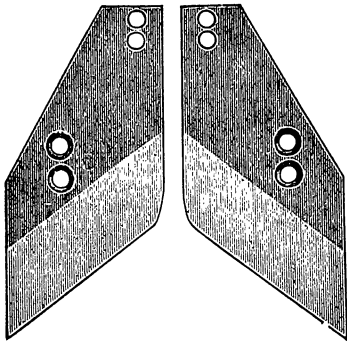
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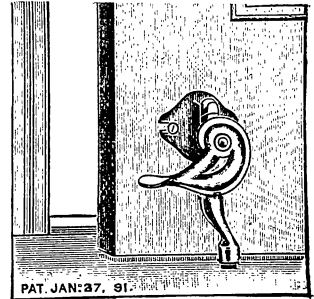
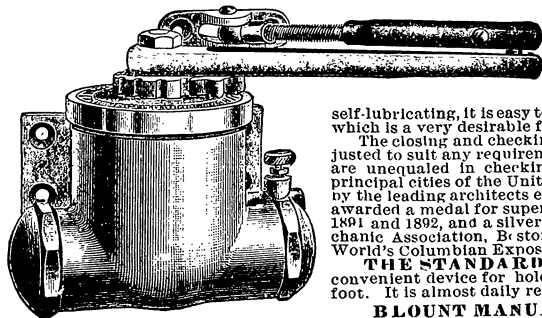
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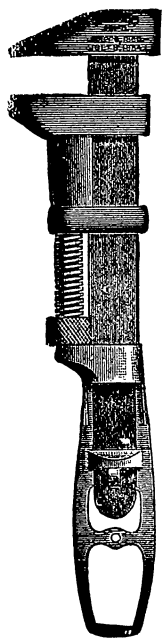
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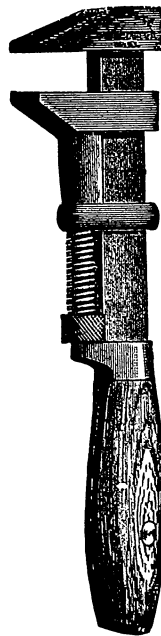
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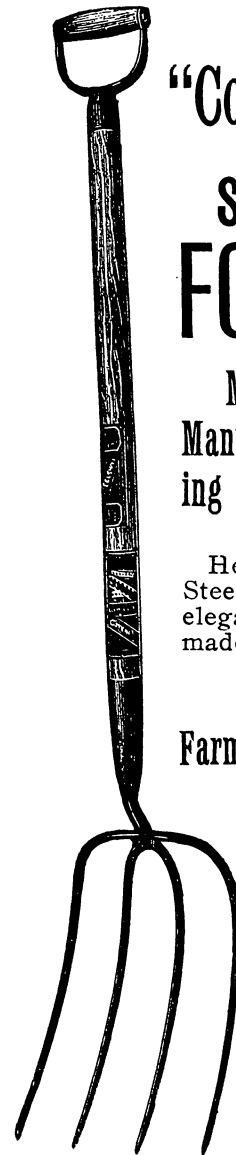
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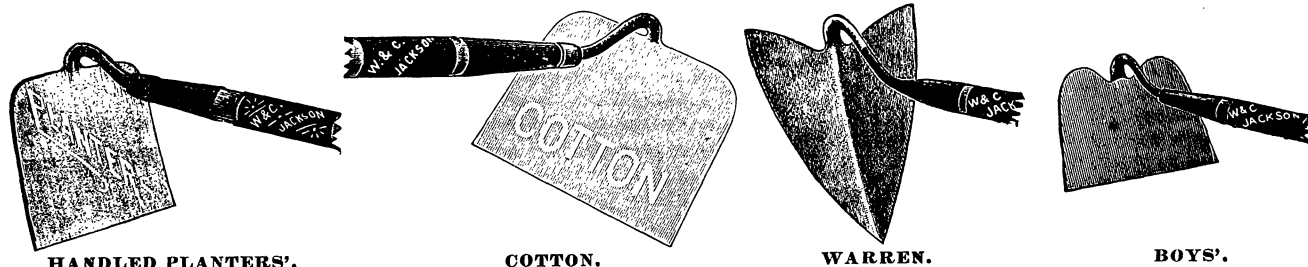
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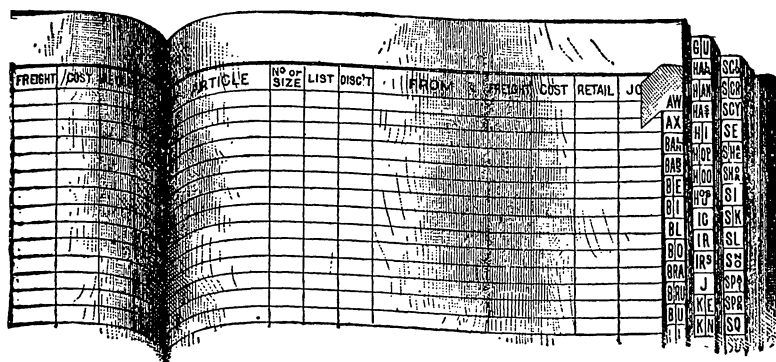
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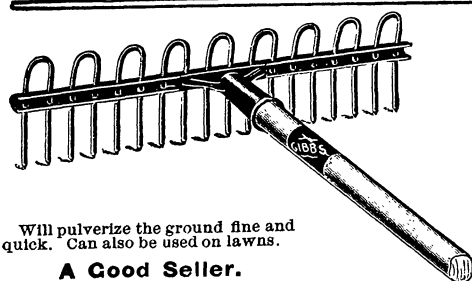
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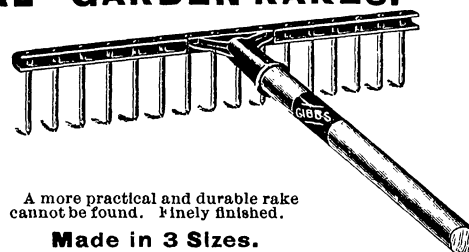
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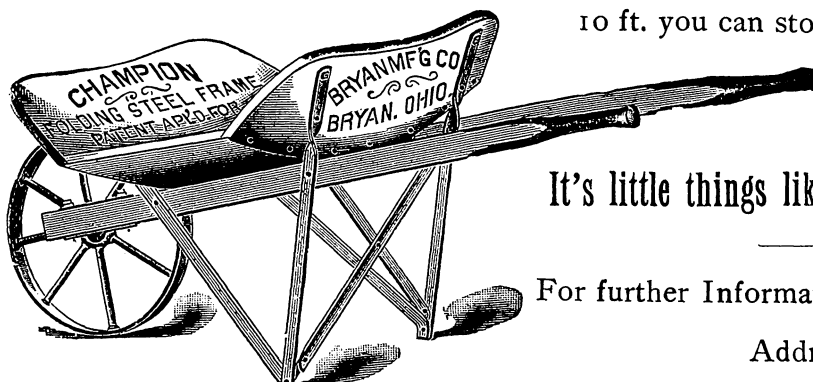


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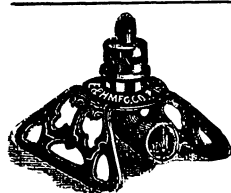
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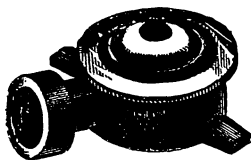


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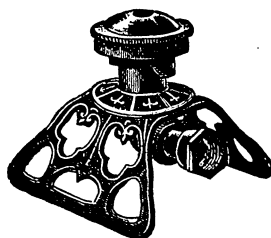
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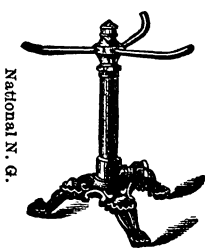


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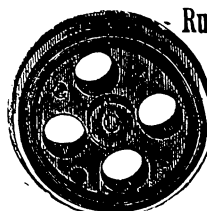
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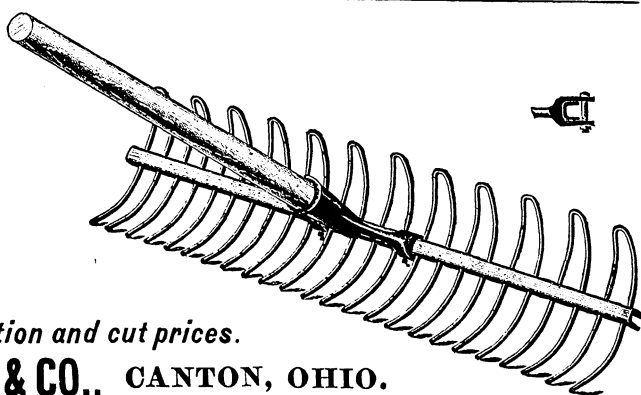
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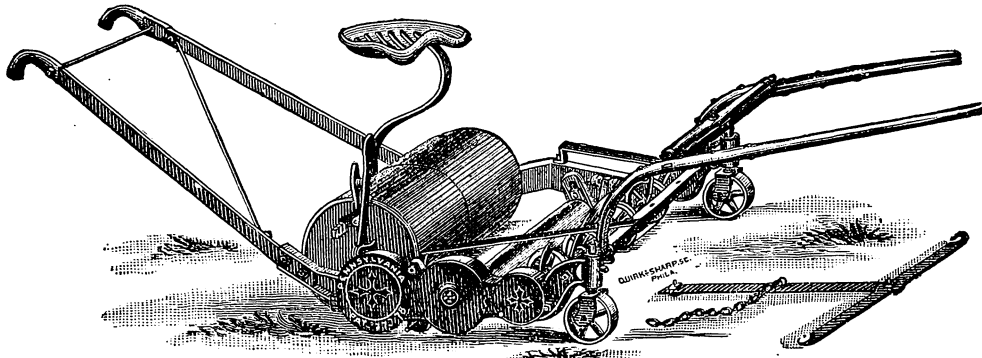
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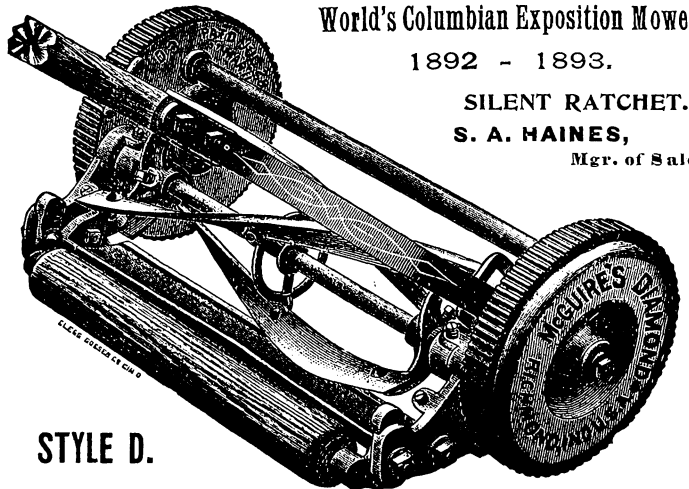
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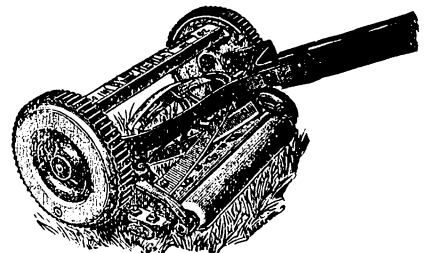
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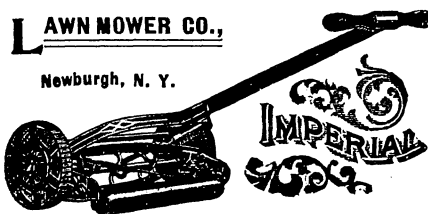


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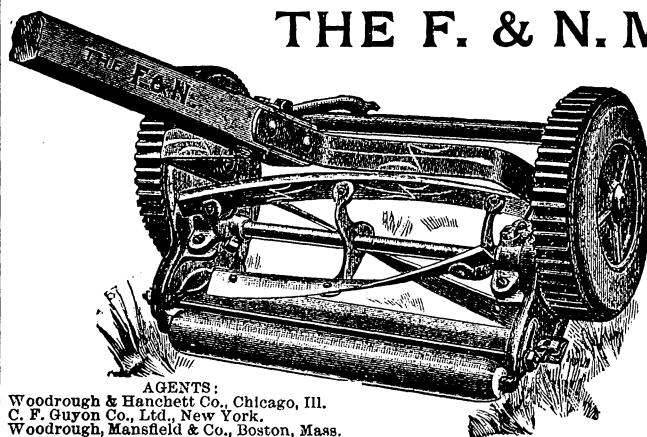
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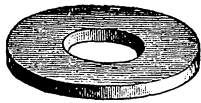
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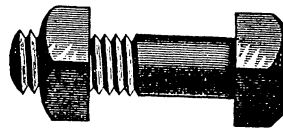
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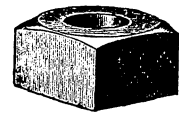
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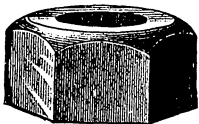
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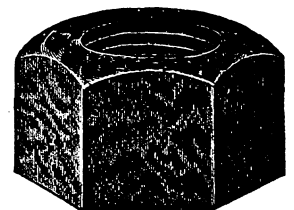
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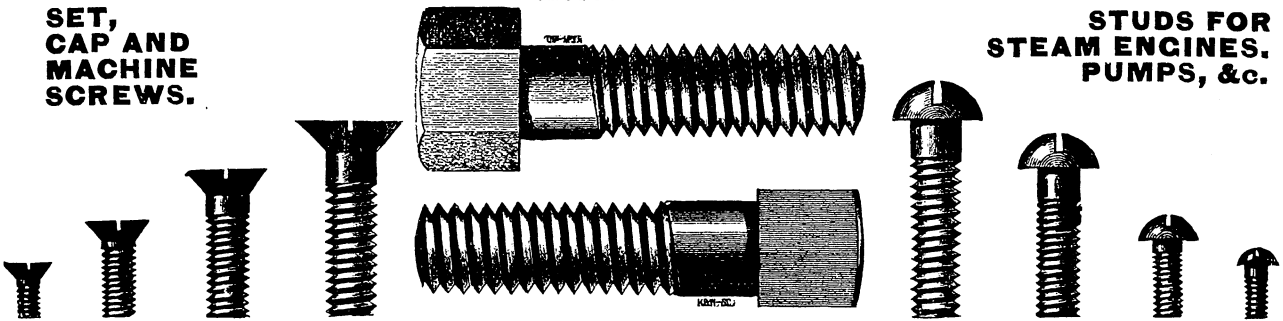
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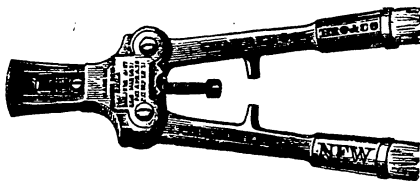


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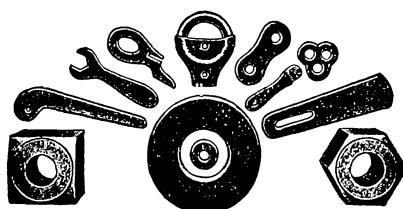
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Lovell, Jno. P. Arms Co., Boston, Mass.
Schoverling, Daly & Gales, 302 Broadway, N. Y.
Stevens, J. Arms and Tool Co., Chicopee Falls, Mass.
Union Metallic Cartridge Co., 313 & 315 Broadway, N. Y.

Attorney at Law.
Coleman, I. A., Chicago, Ill.

Auctioneers.
Bissell, E. Son & Co., N. Y.

Auger Bits.
Bridgeport Gun Implement Co., 313-315 Broadway, New York.

Axes.
Peck, A. G. & Co., Cohoes, N. Y.

Axe Wedges.
Sawyer Hdw. & Supply Co., Pawtucket, R. I.
Thomas, W. H., Jenkintown, Pa.

Axes, Springs, &c., Manufacturers of.
Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa.
Wurster, F. W. & Co., Brooklyn, N. Y.

Babbitt Metal.
Bridgeport Deoxidized Bronze and Metal Co., Bridgeport, Conn.
Crown Smelting Co., Chester, Pa.
Hertz, T. & Son, St. Louis, Mo.
Keys, W. W. & R. M. Co., Bridgeport, Conn.
Reeves, Paul S., Philadelphia, Pa.
Syracuse Smelting Works, Syracuse, N. Y.

Bakers and Roasters.
Bronson Supply Co., Cleveland, Ohio.

Bale Ties.
Kilmer Mfg. Co., Newburg, N. Y.

Barb Wire and Fence.
Cincinnati Barb Wire Fence Co., Cincinnati, O.
Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa.
Indiana Wire Fence Co., Crawfordsville, Ind.

Bar Iron, Manufacturers of.
Zetina Standard Iron & Steel Co., Bridgeport, Ohio.
Allentown Rolling Mill, Allentown, Pa.

Bar Iron, Manufacturers of.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Montour Iron & Steel Co., Danville, Pa.
Mahoning Valley Iron Co., Youngstown, Ohio.

Bar Iron, Manufacturers of.
Sternbergh, J. H. & Son, Reading, Pa.

Barrel Openers.
Am. Specialty Co., Hartford, Conn.

Bellows, Manufacturers of.
Scott, Geo. M., Chicago, Ill.

Bells.
Bevin Bros. Mfg. Co., East Hampton.

Belt Dressing.
Jos. Dixon Crucible Co., Jersey City, N. J.

Belt Fasteners.
Bristol Co., Waterbury, Conn.
Claffen Mfg. Co., Cleveland, Ohio.
Sawyer Hdw. & Supply Co., Pawtucket, R. I.

Belt Fasteners.
Talcoitt, W. O., Providence, R. I.

Belt, Manufacturers of.
Alexander Bros., 412 N. 3d, Phila.
Jeffrey Mfg. Co., Columbus, O.

Belt, Manufacturers of.
Link-Belt Engineering Co., Phila., Pa.
Main Belting Co., Philadelphia, Pa.

Belt, Manufacturers of.
N. Y. Belting & Packing Co., Ltd., N. Y.
Roberts Mfg. Co., Pittsburgh, Pa.

Belt, Manufacturers of.
Schultz Belting Co., St. Louis, Mo.

Bicycles.

Crawford Mfg. Co., Hagerstown, Md.
Eagle Bicycle Mfg. Co., Torrington, Ct.
Grand Rapids Cycle Co., Grand Rapids, Mich.
League Cycle Co., Hartford, Conn.
Lovell, Jno. P. Arms Co., Boston, Mass.
Pope Mfg. Co., Boston, Mass.

Bicycle Spokes.
Excelsior Needle Co., Torrington, Ct.

Bicycle Sundries.
Bevin Bros. Mfg. Co., E. Hampton, Mass.

Bit Braces.
Amidon Tool Corp., Buffalo, N. Y.
Graham, Jno. H. & Co., 113 Chambers St., N. Y.

Blocks, Tackle, Makers of.
Cleveland Block Co., Cleveland, O.
Fulton Iron & Engine Works, Detroit, Mich.

Blowers.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Sturtevant, B. F. & Co., Boston, Mass.

Boiler Plates.
Carbon Steel Co., Pittsburgh, Pa.
McIlvain, Wm. & Sons, Reading, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.

Boilers, Copper.
Randolph & Clowes, Waterbury, Conn.

Boilers, Steam.
Babeock & Wilcox Co., 30 Cortlandt.
Harrison Safety Boiler Wks., Phila., Pa.
Pollock, W. B. & Co., Youngstown, O.
Porter, H. K., Boston, Mass.

Boilers, Steam.
Southwark Fdy. & Mch. Co., Phila., Pa.
Sterling Co., Chicago, Ill.
Wetherill, Robt. & Co., Chester, Pa.

Bolt Cutters.
Chambers Bros. Co., Philadelphia.
Howard Iron Works, Buffalo, N. Y.
Wells Bros. & Co., Greenfield, Mass.

Books.
Republic Press, 14 Lafayette Place, N. Y.
Williams, David, 98-102 Reade, N. Y.

Boring Machines.
Buckeye Mfg. Co., Union City, Ind.

Box Banders.
Goodell, J. W., Burlington, Vt.

Boxes, Hdw. Shelf, &c.
Green, A. H., 22 Park Place, N. Y.
Jones, Jesse & Co., Philadelphia, Pa.

Brass, Manufacturers of.
Ansonia Brass & Copper Co., N. Y.
Dot, John & Sons, 100 John, N. Y.
Plume & Atwood Mfg. Co., N. Y.

Brass, Manufacturers of.
Randolph & Clowes, Waterbury, Conn.
Rome Brass & Copper Co., Rome, N. Y.
Scovill Mfg. Co., Waterbury, Conn.

Brass, Manufacturers of.
Waterbury Brass Co., 296 B'way, N. Y.

Brass Butt Hinges.
Tiebout, W. & J., 16 & 18 Chambers.

Brass Founders.
Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.

Brass Founders.
Eynons-Evans Mfg. Co., Philadelphia, Pa.

Brass Founders.
Fralin, E. T., Lancaster, Pa.
Haight & Clark, Albany, N. Y.

Brass Founders.
Keys, W. W. & R. M. Co., Bridgeport, Conn.

Brass Founders.
North Bros. Mfg. Co., Phila., Pa.

Brass Founders.
Reeves, Paul S., Philadelphia, Pa.

Brass Goods.
Brass Goods Mfg. Co., 88 Chambers.

Bread and Cake Knives.
Cincinnati Mfg. Co., Cincinnati, O.
Claus Shear Co., Fremont, O.

Bridge Builders.
Berlin Iron Bridge Co., East Berlin, Ct.

Bronze (Tobin).
Ansonia Bronze & Copper Co., 19-21 Cliff Street, N. Y.

Bronze (Tobin).
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.

Brooms and Brushes.
Rice Mfg. Co., New Durham, N. H.

Builders' Hardware.
Deltz, A. E., 97 Chambers St., N. Y.
Reading Hdw. Co., Reading, Pa.

Builders' Hardware.
South, W. A. Co., Salem, Mass.

Builders' Hardware.
Yale & Towne Mfg. Co., Stamford, Ct.

Burr Wheels.
Torrance Iron Co., Troy, N. Y.

Butchers' Steels.
Chatillon, John & Sons, 85-89 Cliff St., N. Y.

Butcher and Shoe Knives, Manufacturers of.
Chatillon, John & Sons, 85-89 Cliff St., N. Y.

Butcher and Shoe Knives, Manufacturers of.
Goos, Y. J., Antrim, N. H.

Butcher and Shoe Knives, Manufacturers of.
Wilson, John, Sheffield, England.

Butts and Hinges.
McKinney Mfg. Co., Allegheny, Pa.

Butts and Hinges.
Sabin Machine Co., Montpelier, Vt.

Stanley Works, New Britain, Conn.
Tiebout, W. & J., 16 Chambers, N. Y.

Calipers and Dividers.
J. Stevens Arms and Tool Co., Chicopee Falls, Mass.

Calipers and Dividers.
Starrett, L. S., Athol, Mass.

Car Axles.
Roberts, A. & P. & Co., Phila.

Carboy Stands.
Wolf, W. & L., Philadelphia, Pa.

Carriage Hardware, Makers of.
Clapp, E. D. Mfg. Co., Auburn, N. Y.

Carriage Hardware, Makers of.
Covert's Saddlery Works, Farmer, N. Y.

Carriage Hardware, Makers of.
Eccles, Richard, Auburn, N. Y.

Carriage Hardware, Makers of.
McKinnon Dash & Hdw. Co., Ltd., Buffalo, N. Y.

Carriage Hardware, Makers of.
Scranton Forging Co., Scranton, Pa.

Carriage Hardware, Makers of.
Smith, H. D. & Co., Plantsville, Conn.

Carriage Hardware, Makers of.
Wilcox & Howe, Birmingham, Conn.

Cartridge Reloading Tools.
Ideal Mfg. Co., New Haven, Conn.

Carvers' Tools.
White, Van Glahn & Co., 15-17 Chatam Square, N. Y.

Casters, Wheel, &c.
Clark G. P., Windsor Locks, Conn.

Castings, Iron and Steel.
Chester Steel Casting Co., Phila.

Castings, Iron and Steel.
Booth, The Lloyd Co., Youngstown, O.

Castings, Iron and Steel.
Boston Casting Co., So. Boston, Mass.

Castings, Iron and Steel.
The Burr & Houston Co., Brooklyn, N. Y.

Castings, Iron and Steel.
Cheney, S. & Son., Manlius, N. Y.

Castings, Iron and Steel.
Chester Steel Casting Co., Phila.

Castings, Iron and Steel.
Chrome Steel Works, Brooklyn, N. Y.

Castings, Iron and Steel.
Eureka Cast Steel Co., Chester, Pa.

Castings, Iron and Steel.
Flagg, Stanley G. & Co., Phila.

Castings, Iron and Steel.
Garland Foundry Co., Cleveland, O.

Castings, Iron and Steel.
Haight & Clark, Albany, N. Y.

Castings, Iron and Steel.
Palmer & De Mooy Fdy. Co., Cleveland, O.

Castings, Iron and Steel.
Parsons, R. E. Co., Bridgeport, Conn.

Castings, Iron and Steel.
Pratt & Cady Co., Hartford, Conn.

Castings, Iron and Steel.
Sessions Foundry Co., Bristol, Conn.

Castings, Iron and Steel.
Shickel, Harrison & Howard Iron Co., St. Louis, Mo.

Castings, Iron and Steel.
Spencer's I. S. Sons, Guilford, Conn.

Castings, Iron and Steel.
Standard Fdy. & Mfg. Co., Cleveland, O.

Castings, Iron and Steel.
Torrance Iron Co., Troy, N. Y.

Castings, Iron and Steel.
Union Lock & Hdw. Co., Lancaster, Pa.

Castings, Iron and Steel.
Walker Mfg. Co., Cleveland, Ohio.

Castings, Iron and Steel.
Wetherill, Robert & Co., Chester, Pa.

Castings, Iron and Steel.
Wilcox, Crittenden & Co., Middletown, Conn.

Castings, Malleable.
Arcade Malleable Iron Co., Worcester, Mass.

Castings, Malleable.
Hammer & Co., Branford, Conn.

Castings, Malleable.
Torrance Iron Co., Troy, N. Y.

Catalogue Files.
Folding Paper Box Co., So. Bend, Ind.

Chains.
Bradlee & Co., Philadelphia.

Chains.
Garland Chain Co., Rankin, Pa.

Chains.
Link Belt Engineering Co., Phila., Pa.

Chains.
McKay, Jas. & Co., Pittsburgh, Pa.

Chimneys.
Phila. Engineering Works, Phila., Pa.

Chisels, Manufacturers of.
Buck Bros., Millbury, Mass.

Chisels, Manufacturers of.
Buck, Chas., Millbury, Mass.

Chisels, Manufacturers of.
White, L. & I. J. Co., Buffalo, N. Y.

Chucks.
Cushman Chuck Co., Hartford, Conn.

Chucks.
Hogson & Pettis Mfg. Co., New Haven, Conn.

Chucks.
Skinner Chuck Co., New Britain, Conn.

Chucks.
Smith & Egge Mfg. Co., Bridgeport, Conn.

Chucks.
Union Mfg. Co., 103 Chambers, N. Y.

Chucks.
Whitton, D. E. Mach. Co., New London, Conn.

Clamps.
Hammer & Co., Branford, Conn.

Clamps.
Le Count, C. W., So. Norwalk, Conn.

Clipping Machines.
Gillette Clipping Machine Co., 201 E. 23d Street, N. Y.

Coal.
Barns, C. K. & Co., Philadelphia, Pa.

Coal.
Wister, Francis, Philadelphia, Pa.

Coffee Mills.
Enterprise Mfg. Co., Phila., Pa.

Coffee Mills.
Parker, Chas. Co., Meriden, Conn.

Coke.
Barns, C. K. & Co., Philadelphia, Pa.

Coke.
Houston, C. B. & Co., Philadelphia, Pa.

Coke.
Raney, W. J., Cleveland, O.

Coke.
Wister, Francis, Philadelphia, Pa.

Collections.
Hardware Board of Trade (Limited), 4 and 6 Warren, N. Y.

Condensers.
Worthington, Henry R., 86 & 88 Liberty Street, N. Y.

Conveying Machinery.
Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.

Conveying Machinery.
Jeffrey Mfg. Co., Columbus, O.

Conveying Machinery.
Link-Belt Engineering Co., Phila., Pa.

Copper.
Ames Sword Co., Chicopee, Mass.

Copper.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.

Copper.
Hendricks Bros., 49 Cliff, N. Y.

Copper.
New Haven Copper Co., 294 Pearl, N. Y.

Copper.
Randolph & Clowes, Waterbury, Conn.

Copper.
Rome Brass & Copper Co., Rome, N. Y.

Copper.
Wister, Francis, Philadelphia, Pa.

Cordage.
Samson Cordage Works, Boston, Mass.

Cork Screws.
Williamson, C. T. Wire Novelty Co., Newark, N. J.

Corrugated Furnaces.
Continental Iron Wks., Brooklyn, N. Y.

Corrugated Iron.
Cincinnati Corrugating Co., Piqua, O.

Corrugated Iron.
Jersey City Galvanizing Co., 112 John St., N. Y.

Corrugated Iron.
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y.

Corrugated Iron.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

Counting Machines.
Durant, W. N., Milwaukee, Wis.

Cranes.
Maris & Beekley, Philadelphia, Pa.

Cranes.
Ridgway, Craig & Sons, Coatesville, Pa.

Cranes.
Sellers, Wm. & Co., Inc., Phila., Pa.

Cranes.
Whiting Foundry Equipment Co., Chicago, Ill.

Cranes.
Yale & Towne Mfg. Co., Stamford, Conn.

Cupolas, Hot Blast.
Byram & Co., Detroit, Mich.

Cupolas, Hot Blast.
Whiting Foundry Equipment Co., Chicago, Ill.

Cutlery, Importers of.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Cutlery, Manufacturers of.
Bingham, W. Co., Cleveland, Ohio.

Cutlery, Manufacturers of.
Dane, Stoddard & Kendall, Boston, Mass.

Cutlery, Manufacturers of.
Goodell Co., Antrim, N. H.

Cutlery, Manufacturers of.
Northampton Cutlery Co., Northampton, Mass.

Cutlery, Manufacturers of.
Wilson, John, Sheffield, England.

Cutlery Display Cases.
Union Show Case Co., Chicago, Ill.

Dampers.
Arcade Mfg. Co., Freeport, Ill.

Dashes and Fenders.
McKinnon Dash & Hdw. Co., Ltd., Buffalo, N. Y.

Dies.
Wilson, J. Fred, Worcester, Mass.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Dish Washers.
Boigliano Mfg. Co., Baltimore, Md.

Door Checks and Springs.
Bardsley, J., 149 & 151 Baxter St

- Egg Beaters.**
North Bros. Mfg. Co., Philadelphia, Pa.
- Electric Bells and Supplies.**
Ostrander, W. R. & Co., 204 Fulton St., New York.
Wollensak, J. F., Chicago, Ill.
- Electric Lights.**
Electric Construction & Supply Co., 18 Cortlandt St., N. Y.
- Electrotypes.**
Keyser, E. T., 15 Beekman St., N. Y.
- Elevator Buckets.**
Clark, W. J. & Co., Salem, O.
- Elevators, Makers of.**
Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
Penna. Elevator Engineering Co., Phila., Pa.
- Emery and Emery Wheels.**
Cutter, Wood & Stevens, Boston, Mass.
Diamond Mach. Co., Providence, R. I.
N. Y. Belting & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sterling Emery Wheel Co., 174 Fulton St., N. Y.
Tanite Co., Stroudsburg, Pa.
- Emery Wheel Dressers.**
Bay State Stamping Co., Worcester, Mass.
- Engineers and Contractors.**
Aiken, Henry, Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, John, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. R., Co., Pittsburgh, Pa.
McClure, Amsler & Co., Pittsburgh, Pa.
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.
- Engines, Gas and Gasoline.**
Buckeye Mfg. Co., Union City, Ind.
Otto Gas Engine Works, Phila., Pa.
Springfield Gas Engine Co., Springfield, Ohio.
- Engines, Steam, Makers of.**
Allis, E. P. Co., Milwaukee, Wis.
Bass Foundry & Machine Works, Ft. Wayne, Ind.
Harris, Wm. A., Steam Engine Co., Providence, R. I.
Norwalk Iron Works Co., So. Norwalk, Conn.
Phila. Engineering Works, Phila., Pa.
Southwark Foundry & Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
Westwick, Jno. & Son, Galena, Ill.
Wetherill, Robt. & Co., Chester, Pa.
- Exerciser.**
Independent Electric Co., Chicago, Ill.
- Expansion Bolts.**
Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila., Pa.
- Exporters.**
Flint & Co., 68 Broad St., N. Y.
- Faucets, Self-Measuring.**
Lane Bros., Poughkeepsie, N. Y.
- Faucets, Wooden, Makers of.**
John Sommer's Son, Newark, N. J.
- Feed-Water Heaters and Purifiers.**
Davis, I. B. & Son, Hartford, Conn.
Harrison Safety Boiler Works, Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Elmwood, Conn.
- Fencing, Iron and Wire.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Chess Bros., Pittsburgh, Pa.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
Kilmer Mfg. Co., Newburgh, N. Y.
The Van Dorn Iron Works Co., Cleveland, O.
- Files, Importers of.**
Moss, F. W., 80 John St., N. Y.
- Files and Rasps, Manufacturers of.**
Arcade File Works, Anderson, Ind.
Banker & White, Troy, N. Y.
Barnett, G. & H., 41 & 43 Richmond, Phila.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.
- Fire Brick, Makers of.**
Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer, B. & Sons, foot E. Houston St., N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro. Co., Woodbridge.
- Fire Doors.**
Berlin Iron Bridge Co., E. Berlin, Conn.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
- Fishing Tackle.**
Dame, Stoddard & Kendall, Boston, Mass.
- Flint and Emery Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Fodder Cutters.**
Silver Mfg. Co., Salem, O.
- Forges, Portable, &c.**
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Foss Mfg. Co., Springfield, Ohio.
Sturtevant, B. F. Co., Boston, Mass.
- Forgings, Iron and Steel.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.
- Forks, Hay and Manure.**
Iowa Farming Tool Co., Ft. Madison, Iowa.
Withington & Cooley Mfg. Co., Jackson, Mich.
- Foundry Facings.**
Dixon, Jos., Crucible Co., Jersey City, N. J.
S. Obermayer Co., Cincinnati, O.
Smith's Pattern Works, Akron, Ohio.
- Foundry Riddles.**
Estey, W. S., 65 Fulton, N. Y.
- Foundry Supplies.**
Diamond Lamp & Flask Co., Richmond, Ind.
S. Obermayer Co., Cincinnati, O.
Rice Mfg. Co., New Durham, N. H.
Smith, J. D., Fdy. Supply Co., Cinn., O.
- Friction Clutches.**
Brown, A. & F., 17 Dey St., N. Y.
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.
- Furnaces, Foundry.**
Byram & Co., Detroit, Mich.
- Gages.**
Leavitt Mch. Co., Orange, Mass.
- Galvanized Material.**
Jersey City Galvanizing Co., 112 John St., N. Y.
- Galvanizing and Tinning.**
Wilcox, Crittenden & Co., Middletown, Conn.
- Gas Producers.**
Wood, R. D. & Co., Philadelphia, Pa.
- Gas Stoves.**
Boigiano Mfg. Co., Baltimore, Md.
- Gas & Steam Fitters' Supplies.**
Pancoast, Henry B. & Co., Phila., Pa.
- Gate Hinges.**
Wrightsville Hdw. Co., Wrightsville, Pa.
- Gear Cutters.**
D. E. Whiton Mach. Co., New London, Conn.
- Gears.**
Boston Gear Works, Boston, Mass.
Lincoln Iron Works, Rutland, Vt.
Pole, Robt. & Son Co., Baltimore, Md.
U. S. Projectile Co., Brooklyn, N. Y.
- Glass Boards.**
Canton Saw Co., Canton, O.
Larkin Rule Co., Saginaw, Mich.
- Glass Cutters.**
Monce, S. G., Bristol, Conn.
- Glaziers' Points.**
Shelton Co., Birmingham, Conn.
- Glue.**
Baeder, Adamson & Co., Phila., Pa.
Dodd, A. W. & Co., Gloucester, Mass.
Russia Cement Co., Gloucester, Mass.
- Grass Catchers.**
Supple Hardware Co., Phila., Pa.
- Grate Guards.**
Dow Wire Works Co., Louisville, Ky.
- Grinding Mills.**
Foss Mfg. Co., Springfield, O.
- Grinding and Polishing Machines.**
Cutter, Wood & Stevens, Boston, Mass.
Diamond Mach. Co., Providence, R. I.
Norton Emery Wheel Co., Worcester, Mass.
- Grindstone Dressing Machinery.**
Blake & Johnson, Waterbury, Conn.
- Grindstones.**
Cleveland Stove Co., Cleveland, O.
- Gun Implements.**
Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.
- Gunpowder, Makers of.**
Lafin & Rand Powder Co., 29 Murray St., N. Y.
- Gymnasium Supplies.**
Independent Electric Co., Chicago, Ill.
- Hack Saw Frames.**
Graham, Jno. H. & Co., 113 Chambers St., N. Y.
- Handles.**
Cleveland Wood Turning Co., Cleveland, O.
- Hangers, Door.**
Chicago Spring Butt Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros., Poughkeepsie, N. Y.
- Hardware Comm'n Merchants.**
Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.
- Hardware Drawers.**
Wernicke Co., Minneapolis, Minn.
- Hardware Jobbers.**
White, Van Glahn & Co., 15-17 Chatham Square, N. Y.
- Hardware Manufacturers.**
Allentown Hardware Works, Allentown, Pa.
Miller Falls Co., 93 Reade St., N. Y.
Stearns, E. C. & Co., Syracuse, N. Y.
Streeter, N. R. & Co., Groton, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.
- Hardware Mfrs. Agents.**
Bingham, W. Co., Cleveland, O.
Clarke, Thomas, St. John, N. B.
Graham, John H. & Co., 113 Chambers, Sickles, Sweet & Lyon, 35 Barclay, N. Y.
- Hardware Specialties.**
Acme Shear Co., Bridgeport, Conn.
Berger Bros., Philadelphia, Pa.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Johnson, S. C., Racine, Wis.
North Bros. Mfg. Co., Philadelphia, Pa.
Ransom Hdw. Co., Burlington, Vt.
Scranton & Co., New Haven, Conn.
Union Lock & Hdw. Co., Lancaster, Pa.
Wilson, J. Fred., Worcester, Mass.
Wrightsville Hdw. Co., Wrightsville, Pa.
- Harness Snaps.**
Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks. Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.
- Hay Tools.**
Myers, F. E. & Bro., Ashland, O.
- Hoes.**
Iowa Farming Tool Co., Ft. Madison, Iowa.
Withington & Cooley Mfg. Co., Jackson, Mich.
- Hog Rings and Ringers.**
Oakes & Irwin, Decatur, Ill.
- Hoisting Machines.**
Box, Alfred & Co., 314 Green, Phila.
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.
Byers, Jno. F. Mch. Co., Ravenna, O.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E. Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
Litchfield Iron Works, Rutland, Vt.
McCoy, Jos. F. & Co., 26 Warren St.
Maris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Spedick, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.
- Hollow Ware.**
Avery Stamping Co., Cleveland, O.
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
Stuart & Peterson Co., Phila., Pa.
- Horse Clippers.**
Gillette Clipping Machine Co., 201 E. 26d St., N. Y.
- Horse Nails, Makers of.**
Capewell Horse Nail Co., Hartford, Conn.
McNol Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.
- Horse and Mule Shoes, Makers of.**
Bryden Horse Shoe Co., Catsaqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Leonard, J., 446 West St., N. Y.
Ed Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.
- Hose.**
Cleveland Rubber Works, Cleveland, O.
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.
- Hydrants, &c.**
McLean, John, 296 & 298 Monroe, N. Y.
- Hydraulic Forging.**
U. S. Projectile Co., Brooklyn, N. Y.
- Hydraulic Machinery.**
Wood, Wm. H., J. edla, Pa.
- Hydraulic Jacks.**
Dudgeon, Richard, 24 Columbia, N. Y.
McCoy, Jos. F. Co., 26 Warren St., N. Y.
- Ice Cream Freezers.**
White Mountain Freezer Co., Nashua, N. H.
- Injectors.**
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York.
- Insurance, Boiler.**
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
- Iron and Steel, Swedish.**
Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.
- Iron Commission Brokers.**
Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Lea, J. & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lea, J. & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. & R. & Co., Phila., Pa.
- Iron Ore.**
Samuel, Frank, Philadelphia, Pa.
- Iron, Merchants.**
Barns, C. K. & Co., Philadelphia, Pa.
Borden & Co., 70 West, N. Y.
Bussenus & Cunliffe, Philadelphia.
Corning, Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.
- Pierson & Co., 29 Broadway, N. Y.**
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., 60 B'way, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.
- Iron, Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Lundberg, Gustaf, Boston, Mass.
- Iron Sheet, Manufacturers of.**
Cambridge Iron & Steel Co., Cambridge, Ohio.
W. Dewees Wood Co., Ltd., McKeesport, Pa.
- Ironwork, Ornamental.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
The Van Dorn Iron Works Co., Cleveland, O.
- Japanning.**
Smith, Theo. V., 54 John St., N. Y.
- Keys.**
Wollensak, J. F., Chicago, Ill.
- Ladles.**
Whiting Fdy. Equipment Co., Chicago, Ill.
- Lanterns.**
Buhl Stamping Co., Detroit, Mich.
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Lasts.**
Kupferle, Jno. C., St. Louis, Mo.
- Lathes.**
Beman & Smith, Providence, R. I.
Dietz, Schumacher & Co., Cincinnati, O.
Draper Machine Tool Co., Worcester, Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.
New Haven Mfg. Co., New Haven, Conn.
Sebastian Lathe Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Lathing, Expanded Metal.**
Chess Bros., Pittsburgh, Pa.
- Lathing, Wire.**
Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Lawn Mowers.**
Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.
Coldwell Lawn Mower Co., Newburgh, N. Y.
Dille & McGuire Mfg. Co., Richmond, Ind.
F. & N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.
Supple Hdw. Co., Phila., Pa.
- Lawn Rakes.**
Gibbs Mfg. Co., Canton, Ohio.
Kohler, F. E. & Co., Canton, O.
- Lawn Sprinklers.**
Blair Mfg. Co., Springfield, Mass.
Ette & Henger Mfg. Co., St. Louis, Mo.
McGowan, John H. Co., Cincinnati, O.
- Letters and Figures, Metallic.**
White, A. A. & Co., Providence, R. I.
- Letters, Paper.**
Tablet & Ticket Co., Chicago, Ill.
- Levels.**
Richardson, C. F. & Son, Athol, Mass.
- Locks and Knobs, Manufacturers of.**
Dietz, A. E., 97 Chambers, N. Y.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Warner Lock Co., Chicago, Ill.
Yale & Towne Mfg. Co., Stamford, Conn.
- Lubricants.**
Dixon, Jos., Crucible Co., Jersey City, N. J.
- Machinery.**
Am. Tool Works, Cleveland, Ohio.
Ayer, H. C. & Gleason Co., Phila., Pa.
Barnes, W. F. & John, Rockford, Ill.
Beman & Smith, Providence, R. I.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 46 Dey, N. Y.
Bignall & Keeler Mfg. Co., St. Louis.
Bliss, E. W. Co., Brooklyn, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Bullard Mch. Tool Co., Bridgeport, Conn.
Carlin's Sons, Thos., Allegheny, Pa.
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Detrick & Harvey Mch. Co., Baltimore, Md.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Laight & Canal Sts.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.
Hartford Machine Screw Co., Hartford, Conn.
Hendey Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Howard & Morse, 45 Fulton St., N. Y.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Davis Mch. Tool Co., Cincinnati, O.
Lodge & Shipley Mch. Tool Co., Cincinnati, O.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinists' Supply Co., Rochester, N. Y.
Manville, E. J., Mch. Co., Waterbury, Conn.
Newark Mch. Tool Wks., Newark, N. J.
New Haven Mfg. Co., New Haven, Ct.
New York Machinery Depot, 178 Broadway, New York.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.

- Place, Geo.**, 145 Broadway, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons, L. F., Philadelphia, Pa.
Sigourney Tool Co., Hartford, Conn.
Steptoe, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ltd., Phila.
Toomey, Frank, Philadelphia, Pa.
Walker Mfg. Co., Cleveland, O.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**
 Adt. Jno. & Son, New Haven, Conn.
- Machine Knives.**
 Loring, Coes & Co., Worcester, Mass.
 Loyd, John, 558-562 Water St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.
- Machine Screws.**
 Bubbell, Harvey, Bridgeport, Ct.
 Rhode Island Tool Co., Providence, R. I.
- Machine Tools.**—See Machinery.
- Machine Work.**
 Papping, J., 68th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**
 Coffin & Leighton, Syracuse, N. Y.
 Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
 King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.
- Manufacturing Sites.**
 Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.
- Measuring Tapes.**
 Lufkin Rule Co., Saginaw, Mich.
- Meat Choppers.**
 Enterprise Mfg. Co., Philadelphia, Pa.
- Meat Cutters.**
 North Bros. Mfg. Co., Philadelphia, Pa.
- Mechanical Instruction.**
 Correspondence School of Mechanics, Scranton, Pa.
- Metals.**
 Peering, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**
 American Metal Co., N. Y.
- Metal Saws.**
 Q. & C. Co., Chicago, Ill.
- Metallurgists.**
 Britton, J. Blodgett, Phila., Pa.
- Mining Knives.**
 Palmer Hdw. Mfg. Co., Troy, N. Y.
 Streeter, N. R. & Co., Groton, N. Y.
- Mine Lamps.**
 Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
- Mining Screens.**
 Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton, N. Y.
- Mining Machinery.**
 Allis, E. F. Co., Milwaukee, Wis.
- Models, Makers of.**
 Ideal Machine Works, Hartford, Conn.
- Molding Sand.**
 Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**
 Boligiano Mfg. Co., Baltimore, Md.
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Machinery.**
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**
 Am. Specialty Co., Hartford, Conn.
 Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**
 Borden & Lovell, 70 West, N. Y.
 Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
 Valley Steel Co., St. Louis, Mo.
- Nickel Plated Supplies.**
 Eddy Electric Mfg. Co., Windsor, Conn.
- Norway Shapes, Rollers of.**
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**
 Ideal Machine Works, Hartford, Conn.
- Nut Machines.**
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
 American Bolt Co., Lowell, Mass.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Conn.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.
 Port Chester Bolt & Nut Co., Port Chester, N. Y.
 Rhode Island Tool Co., Providence, R. I.
 Russell, Burdall & Ward, Port Chester, N. Y.
 Sternbergh, J. H. & Son, Reading, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.
- Oilers.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oil Heaters.**
 Rochester Lamp Co., 42 Park Place, New York.
 Standard Lighting Co., Cleveland, O.
- Oilless Anti-Friction Metals.**
 North American Metalline Co., Long Island City, N. Y.
- Oil Stones.**
 Pike Mfg. Co., Pike Station, N. H.
- Ores.**
 Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**
 Scranton Forging Co., Scranton, Pa.
- Packing.**
 Morrison, Robert, St. Louis, Mo.
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**
 Ames Sword Co., Chicopee, Mass.
 Fraim, E. T., Lancaster, Pa.
 Union Lock & Hdw. Co., Lancaster, Pa.
 Wolf, W. & L., Phila., Pa.
- Pails.**
 Richmond Cedar Wks., Richmond, Va.
- Paint.**
 Garry Iron & Steel Roofing Co., Cleveland, O.
- Paint Burners.**
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
 Butler, C. N., Phila., Pa.
 Jenner, H. W. T., Washington, D. C.
 Howson & Howson, Philadelphia and Washington.
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**
 Wells, Heber, 157 William St., N. Y.
- Perforated Metal.**
 Clinton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**
 Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**
 Plumb, Fayette R., Philadelphia, Pa.
- Pig Iron.**
 Houston, C. B. & Co., Philadelphia, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Pilling & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
 Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**
 Armstrong Mfg. Co., Bridgeport, Conn.
 Bignall & Keeler Mfg. Co., St. Louis, Mo.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Merrill Mfg. Co., Toledo, O.
 Pencoast, Henry B. & Co., Phila.
 Saunderson's Sons, D., Youkers, N. Y.
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas. Makers of.**
 Donaldson Iron Co., Emaus, Pa.
 Riverside Iron Works, Wheeling, W. Va.
 Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**
 Buck Bros., Millbury, Mass.
 Buck, Chas., Millbury, Mass.
- Planers.**
 Detrick & Harvey Mch. Co., Baltimore, Md.
 New Haven Mfg. Co., New Haven, Conn.
 Powell Planer Co., Worcester, Mass.
 Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**
 Stanley Rule & Level Co., N. Y.
- Plated Ware.**
 Boardman, L. & Son, New Haddam, Ct.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**
 Atna-Standard Iron & Steel Co., Bridgeport, O.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, Ohio.
 Moorhead McLean Co., Pittsburgh, Pa.
 McIlwain & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Iron & Steel Co., Pottsville, Pa.
 Slinger, Nimick & Co., Pittsburgh, Pa.
 The Mahoning Valley Iron Co., Youngstown, O.
 Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**
 Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**
 Gibbs Mfg. Co., Canton, Ohio.
 Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**
 Barnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 "Silver Finish."
 Tyler Wire Works Co., W. S., Cleveland, O.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
 Lafin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.
- Power Hammers.**
 Dieneit & Eisenhardt, Philadelphia.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Jenkins & Lingle, Bellefonte, Pa.
 Milner & Peck Mfg. Co., New Haven
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury Ct.
- Presses, Power, Makers of.**
 Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Printing and Embossing.**
 Griffith, Axtell & Cady Co., Holyoke, Mass.
- Pulleys.**
 Brown, A. & F., 17 Dey St., N. Y.
 Dodge Mfg. Co., Mishawaka, Ind.
 Keystone Clutch Mch. Wks., Phila., Pa.
 Reading Wood Pulley Co., Reading, Pa.
- Pumping Machinery.**
 Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Hooker-Colville Steam Pump Co., St. Louis, Mo.
 McIlwain, J. H. & Co., Cincinnati, O.
 Maslin, J. & Son, Jersey City, N. J.
 Norwalk Iron Works Co., So. Norwalk Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Works, Easthampton, Mass.
 Warrington, Henry R., 86 and 88 Liberty St., N. Y.
- Pump Leathers.**
 Detroit Valve & Washer Co., Detroit, Mich.
- Pumps, Makers of.**
 Deming Co., Salem, O.
 Douglas, W. & B., Middletown, Conn.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Millar, C. & Sons, Utica, N. Y.
 Myers, F. E. & Bro., Ashland, O.
 Peters Pump Co., Kewanee, Ill.
 Red Jacket Mfg. Co., Davenport, Iowa.
- Punches.**
 Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
 Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
 Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**
 Burditt & Williams, Boston, Mass.
 Estey, W. S., 65 Fulton, N. Y.
 Excelsior Cutlery Co., Worcester, Mass.
- Razor, Manufacturers of.**
 Millbury Razor Co., Millbury, Mass.
- Reducing Valves.**
 D'Este & Seelye Co., Boston, Mass.
- Reels.**
 Hendryx, A. B. Co., New Haven, Conn.
- Refrigerator Door Fasteners.**
 Conroy, P. J. & Co., Philadelphia.
- Rivets.**
 Blake & Johnson, Waterbury, Conn.
 Burden Iron Co., Troy, N. Y.
 Clark & Cowles, Plainville, Conn.
 Cobb & Drew, Plymouth, Mass.
 Sternbergh, J. H. & Son, Reading, Pa.
 Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**
 Adt. Jno. & Sons, New Haven, Conn.
- Rolling Mill Machinery.**
 Birmingham Iron Fdry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 Leeburg Foundry & Mch. Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 Robinson-Rea Mfg. Co., Pittsburgh.
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
 Trethewey Mfg. Co., Pittsburgh, Pa.
 Waterbury Farrel Foundry & Mch. Co., Waterbury Conn.
- Rolls, Chilled, Sand and Steel.**
 Birmingham Iron Foundry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 East Chicago Fdry Co., Chicago, Ill.
 Garrison, A. Fdry Co., Pittsburgh, Pa.
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.
 Seaman, Sleeth & Black, Pittsburgh.
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
- Roofing.**
 Berlin Iron Bridge Co., E. Berlin, Conn.
 Cincinnati Corrugating Co., Piqua, O.
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**
 Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
 Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
 Stanley Rule & Level Co., 29 Chambers.
 Stephens & Co., Riverton, Conn.
- Sad Irons.**
 Enterprise Mfg. Co., Phila., Pa.
 Streeter, N. R. & Co., Groton, N. Y.
- Sad Irons, Gas.**
 Boligiano Mfg. Co., Baltimore, Md.
- Sand Paper.**
 Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
 Caldwell Mfg. Co., Rochester, N. Y.
 Pullman Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains.**
 Morton, Thos., 45 Elizabeth, N. Y.
 Samson Cordage Works, Boston, Mass.
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Pulleys.**
 Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
 Brown, E. E. & Co., Philadelphia, Pa.
 Kings County Iron Foundry, Brooklyn, N. Y.
 Norton Bros., Chicago, Ill.
- Saw Filing Machines.**
 Diston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**
 Atkins, E. C. & Co., Indianapolis, Ind.
 Diston, Henry & Sons, Phila., Pa.
 National Saw Co., Newark, N. J.
 Simonds Mfg. Co., Fitchburg, Mass.
- Saw Sets.**
 Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Saw Vises.**
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Sawing Machines.**
 Q. & C. Co., Chicago, Ill.
- Scales, Manufacturers of.**
 Buffalo Scale Co., Buffalo, N. Y.
 Chatillon, John & Sons, 85-89 Cliff, N. Y.
 Standard Scale & Fixtures Co., St. Louis, Mo.
- Scrapers, Road.**
 Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screw Cutting Machinery.**
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
 Brown, R. H. & Co., New Haven, Conn.
 Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Machinery.**
 Hartford Machine Screw Co., Hartford, Conn.
- Screw Plate and Pipe Cutter.**
 Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Wm. H. Haskell Co., Pawtucket.
 Miles, F. S., 205 Quarry, Philadelphia.
 Reynolds & Co., New Haven, Conn.
 Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**
 Barnes, W. F. & John, Rockford, Ill.
 Millers Falls Co., 93 Reade St., N. Y.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Slythe Stones and Whetstones.**
 Pike Mfg. Co., Pike Statn, N. H.
 Cleveland Stone Co., Cleveland, O.
- Shafting, Makers of.**
 Brown, A. & F., 17 Dey St., N. Y.
 Cresson, Geo. V. Co., Philadelphia, Pa.
 Fairmount Mch. Co., Philadelphia, Pa.
 Sellers, Wm. & Co., Inc., Phila., Pa.
 Stow Mfg. Co., Binghamton, N. Y.
- Shaft Support.**
 Decatur Shaft Support Co., Decatur, Ill.
- Shaped Iron and Steel, Manufacturers of.**
 Atna-Standard Iron & Steel Co., Bridgeport, O.
 East Chicago Fdry Co., Chicago, Ill.

See Alphabetical Index, Pages 99 & 100.

- Allentown Rolling Mill, Allentown, Pa.**
Lockhart Iron & Steel Co., Pittsburgh, Pa.
- Passaic Rolling Mill Co., Paterson, N.J.**
The Phoenix Iron Co., Phila., Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
- Shears and Scissors.**
Acme Shear Co., Bridgeport, Conn.
Claus Shear Co., Fremont, Ohio.
Heinrichs, R. Sons Co., Newark N. J.
- Sheet Iron and Steel, Manufacturers of.**
Etna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Jersey City Galvanizing Co., 112 John St., N. Y.
Mahoning Valley Iron Co., Livingston, Ohio.
Morehead-McCleane Co., Pittsburgh, Pa.
Pierson & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc.**
Mathlessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
Atlas Mfg. Co., New Haven, Conn.
Stanley Works, New Britain, Conn.
- Shoe Stands.**
Kupferle, Jno. C., St. Louis, Mo.
- Shovels.**
Peninsular Metal Works, Detroit, Mich.
- Show Cases.**
Union Show Case Co., Chicago, Ill.
- Sinks.**
Douglas, W. & B., Middletown, Conn.
- Skate Grinding Machinery.**
Perkins, Chas., Bridgewater, Mass.
- Skates, Ice.**
Barney & Berry, Springfield, Mass.
Dame, Stoddard & Kendall, Boston, Mass.
Keene Mfg. Co., Keene, N. H.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**
Henley, M. C., Richmond, Ind.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Slag Machines.**
Cambria Iron Co., Johnstown, Pa.
- Slaw Cutters.**
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.
- Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
Clendenin Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.
- Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
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- Steel Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'way, N. Y.
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Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
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Kayser, Ellison & Co., Sheffield, Eng.
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Landon Iron Co., 58 William St., N. Y.
Lukens Iron & Steel Co., Coatesville, Pa.
Morehead-McCleane Co., Pittsburgh, Pa.
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Bowland, Wm. & Harvey, Frankford, Philadelphia.
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Wordlaw, S. & Co., Sheffield, Eng.
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Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 E'way, N. Y.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.
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Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.
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Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stone Saws and Planers.**
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Cobb & Drew, Plymouth, Mass.
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Riehle Bros. Testing Mach. Co., Phila.
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- Tire Upsetters.**
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- Toe Calks, Steel.**
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- Tool Holders.**
Armstrong Bros. Tool Co., Chicago, Ill.
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Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers, New York, N. Y.
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Stevens, J., Arms & Tool Co., Chicopee Falls, Mass.
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Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Oster Mfg. Co., Cleveland, Ohio.
Plumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
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Merrill Bros., Brooklyn, E. D.
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Morse Twist Drill & Machine Co., New Bedford, Mass.
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Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
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Wetherell Bros., 93 Liberty St., N. Y.
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N. J. Wire Cloth Co., Trenton, N. J.
New York Wire Cloth Co., 102 Chambers St., N. Y.
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- Wire Cutters.**
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- Wire Dies.**
McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John St., N. Y.
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New York Wire Cloth Co., 102 Chambers St., N. Y.
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Wickwire Bros., Cortland, N. Y.
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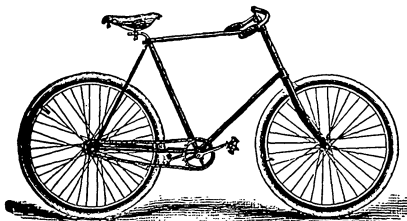
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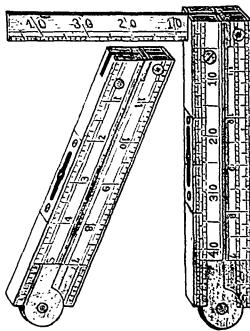
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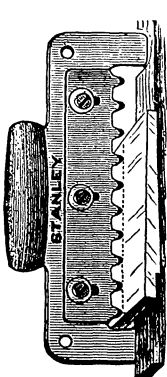
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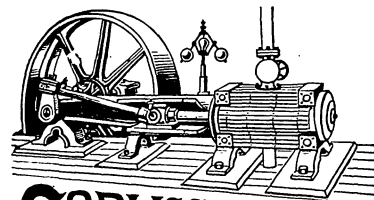
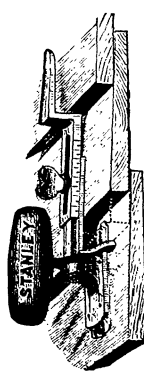
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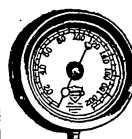
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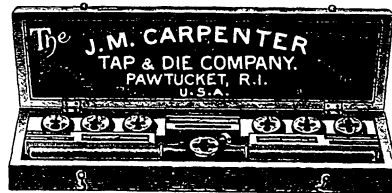
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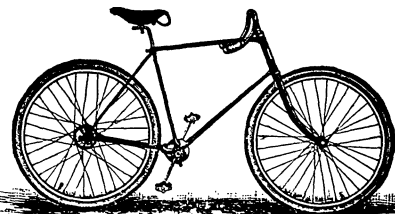
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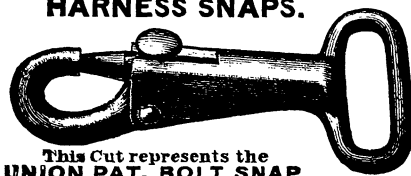
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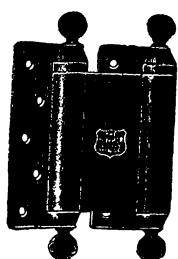
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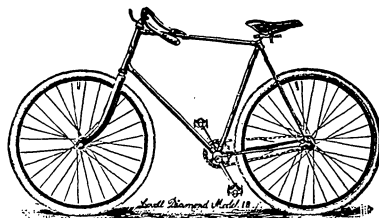
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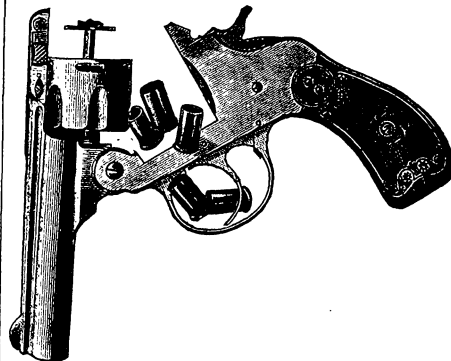
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The Automatic Movements.

The main features of the mechanism for the automatic movements are shown in the side elevation, Fig. 1. They consist of a single longitudinal cam shaft located underneath the turret and spindle heads, upon which are borne all the cam pulleys and disks for operating the turret S, the cross slide W for

m' , to the right of which, on the end of the shaft, is a cam carrying disk which operates the shipper controlling the belt on the pulleys j k , Figs. 2 and 4. Engaging with this worm wheel is the worm m secured to the shaft carrying the pulleys. The pulley k is keyed to the shaft, the other being loose. Formed with the pulley j is the pinion h which is cut, in this particular case, with 24 teeth. A second pinion g , having 23 teeth, is mounted loosely on the shaft. This pinion carries a ratchet wheel i whose pawl is pivoted to the frame. Engaging with both of the pinions g , h

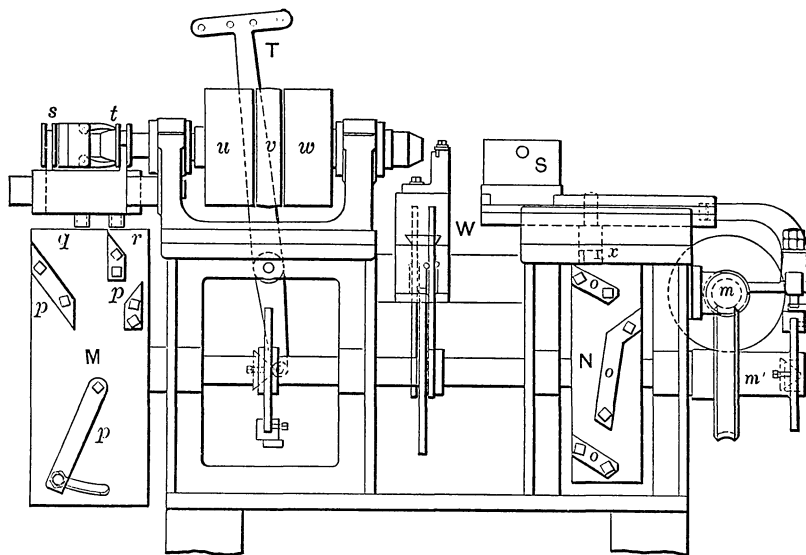


Fig. 1.—Side Elevation of Automatic Screw Machine.

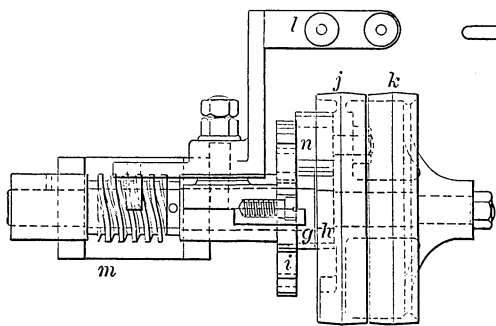


Fig. 2.—Side Elevation.

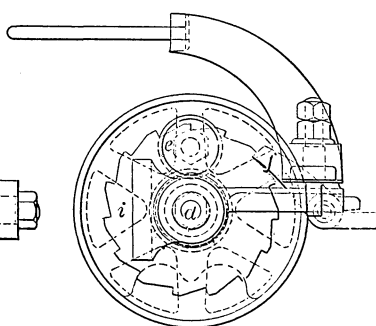


Fig. 3.—End Elevation.

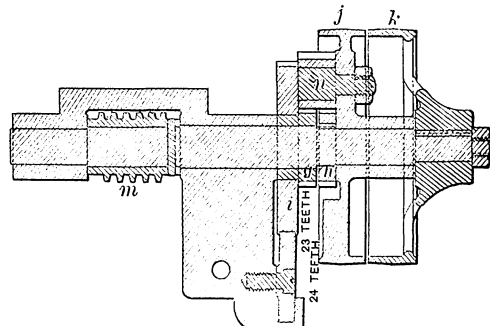


Fig. 4.—Section Parallel with Worm Shaft.

SPEED CHANGING MECHANISM.

THE HARTFORD AUTOMATIC SCREW MACHINERY.

their merits." These machines are simple in construction and capable of being changed from one class of work to another as easily as hand machines, this being due to the early adoption by this company of the approved "monitor" construction, merely making the machines automatic and thereby enabling one operator to attend to several. By the courtesy of the Hartford Company we are permitted in the following to describe the most important features of construction and operation of some of the leading types of automatic screw machines built by them. To show the application, we would state that these machines are now running on all classes of bicycle work, including hubs, nuts, cups, shafts, cones, studs, &c., and all

the cutting-off tool, the chucking and feeding mechanism t and s worked by the cam pulley M , and the devices for reversing the spindle by means of the belt shipper T .

This cam shaft is driven by a very simple and effective device by which it may be rotated at varying speeds, so that when the change is being made from one cutting operation to another, it is turned at a much higher speed, the ratio of which is not less than 20 to 1. The speed changing mechanism is shown in position on the machine in Fig. 1; its construction is very clearly shown in Figs. 2, 3 and 4, which present it in side and end elevation and in section parallel with the worm shaft. On the cam shaft is mounted the worm wheel

is the wide pinion n which is carried on a stud on the pulley j . It will now be understood that when the belt is on the pulley j , which carries the pinion h and the wide pinion n , the worm m will be revolved at its slowest speed. The pulley j carries the pinion n with it, and at each revolution the pinion g moves forward the distance of only one tooth. The maximum speed is attained when the belt is shifted to the pulley k , which is keyed to the shaft.

The shipper arm actuating this belt is operated by adjustable arms, so that the duration of either motion is always under complete control without any change except in the adjustment of the cams, such adjustment being made by loosening one screw and moving each

cam around the circumference of the disk to accommodate the length of cut to be made.

The turret *S* is operated by a cam pulley, *N*, upon the face of which are bolted the cams, which are made of pieces of flat steel bent to the form required by the work to be performed, and we would call particular attention to the fact that while in some cases it is advantageous to form the cams specially for the piece to be produced, it is not necessary to do so, for when it is desirable to use the machines for various styles of work one set of cams will produce all articles within its capacity. We would also call attention to the fact that owing to their simplicity these main cams can be designed and applied by an operative of ordinary ability, doing away with the necessity of employing a skilled mechanic to lay them out, as is the case on almost all other automatic machines, which require an expensive set of cams for each piece produced. The cams for chucking and feeding the stock never have to be changed, as they are adjustable for all variations of work, as will be hereafter explained.

The chucking mechanism *t*, Fig. 1, consists of a split chuck or collet formed from one piece of steel with a tapered end designed to be forced into a socket of corresponding taper, thereby closing the jaws to grasp the stock, and is operated by a plunger passing through the spindle, the plunger being actuated by two fingers and a wedge, which system

claims of this invention, calls for special mention. This claim has proved so broad, and the system is so satisfactory, it has as yet been impossible to find a substitute for handling all classes of work. It consists of a plunger passing through the chucking plunger from the rear, into the forward end of which is screwed a

while the tools in the turret are operating on the piece to be produced, the feed plunger is drawn back by an adjustable cam, causing the friction collet to be slipped back over the stock to the extent of the required length of feed, leaving the plunger in position to be operated upon at the proper time by the feed cam. Both of these devices are

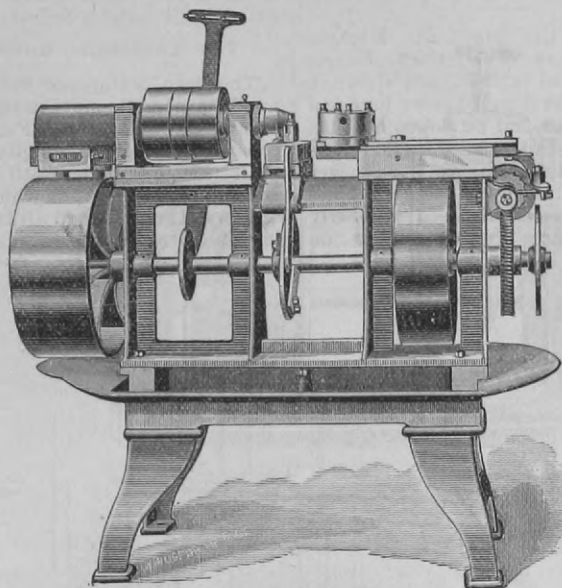


Fig. 5.—Automatic Screw Machine.

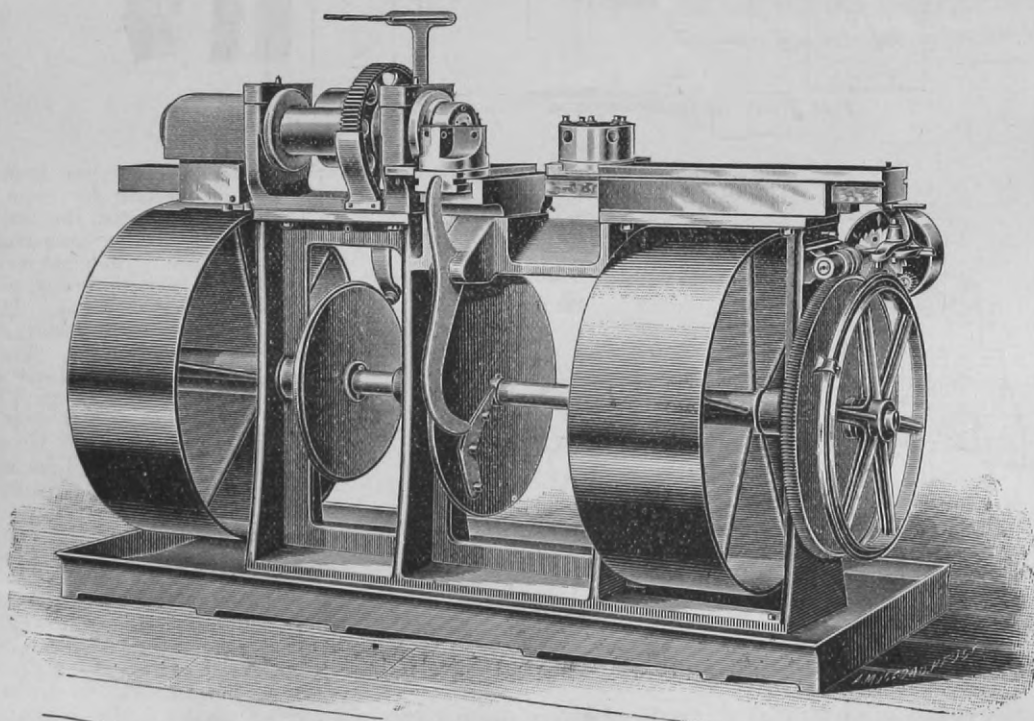


Fig. 6.—Automatic Screw Machine with Turret on the Cross Slide.

THE HARTFORD AUTOMATIC SCREW MACHINERY.

is recognized as the most desirable device for this purpose. The grip of the chuck is adjusted by a threaded collar mounted on the rear end of the spindle and is very simple and strong. The chucks can be changed from one side to another very quickly by simply unscrewing the shell on the end of the spindle, which can be done in a moment.

The feeding mechanism *s*, which was one of the strongest of the original

collet made of a single piece of steel bored out to fit the stock and split longitudinally nearly its whole length with a slot of considerable width, then closed and spring tempered, so that when the rod is passed through it forms a frictional grip strong enough to carry the bar of stock forward with the plunger when the latter is operated upon by the feed cam. After the chuck has closed on the stock with the feed plunger in its forward position, and

operated by the cams *p* on the face of the pulley *M*, the stud *r* controlling the chuck and the stud *q* governing the feed.

The constructions above, described are all embodied in the automatic screw machine, Fig. 5, but in this engraving the cams on the faces of the cam pulleys have been omitted.

Miscellaneous Attachments.

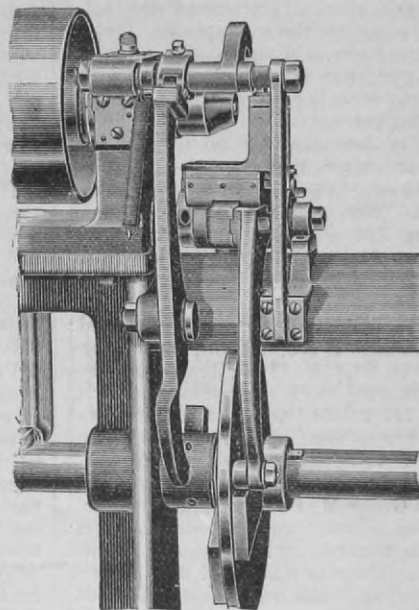
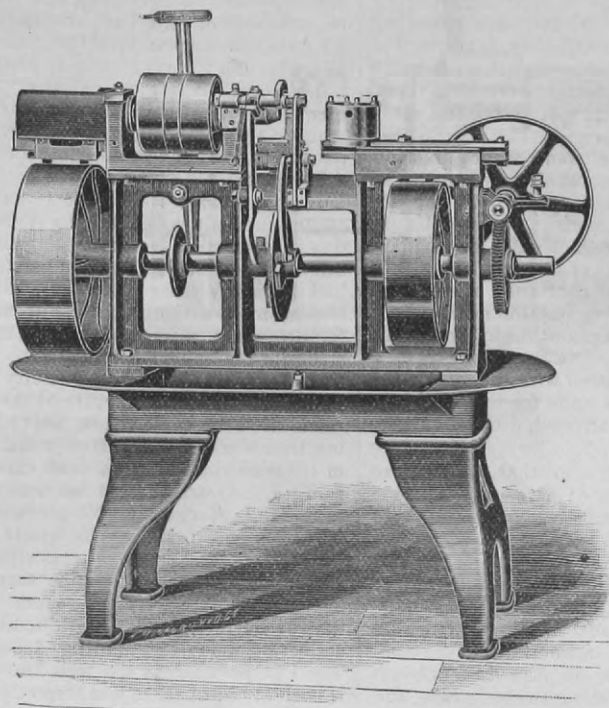
In place of the ordinary cross slide, a slide on which is mounted an extra tur-

ret is often used, Fig. 6, designed to carry circular forming tools for producing knurled thumb screws, wrench nuts, wrench screws, chuck shells, bit brace sleeves, &c., also an oscillating forming fixture can be attached which greatly increases the production of many kinds of work and in a special form produces bicycle hubs directly from the bar in the most satisfactory

spindles. Suitable collars are provided for taking up wear. The two arms F G carry at their upper ends the cutters I H, and at their lower ends are provided with rollers engaging cams on the disk E, which is mounted on the main shaft. The revolution of this disk serves to move the cutting tools I and H toward the work carried by the spindle. When this device is arranged

ries at its upper end the knurling tool C. After this fixture has done its work it is lifted clear of all other tools, making it a desirable device for this, at many times, perplexing operation.

The Lincoln Foundry & Machine Company.—The new plant of the Lincoln Foundry & Machine Company of



Figs. 7 and 8.—Oscillating and Compound Knurling Attachment.

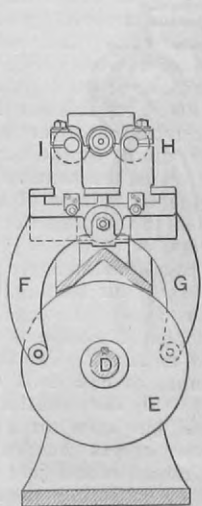


Fig. 9.—Cross Section of Oscillating Attachment.

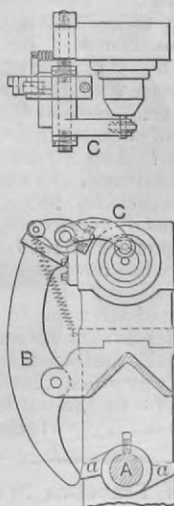


Fig. 10.—Plan and Cross Section of Knurling Attachment.

THE HARTFORD AUTOMATIC SCREW MACHINERY.

manner. There is also a drilling device which is used in connection with the latter and for a great variety of other screw machine work, by which the drill is rotated in the opposite direction to the motion of the spindle, insuring accurate and at the same time very rapid work.

The oscillating attachment, shown in perspective in Fig. 7, in enlarged perspective in Fig. 8 and in cross-section in Fig. 9, is mounted on a tapered stud placed under and parallel with the

for bicycle hub work the cams are adjusted so that the cutter I will reduce one-half the hub, when the cutter H will be fed forward to finish the other half. At the same time the outer end of the hub is finished, and it is drilled by a special device shown in Figs. 11 and 12, which will be presented in the second part of this article.

The compound knurling attachment, Fig. 10, is very similar to the oscillating device. The cams *a a* on the main shaft A actuate the lever B, which car-

Pittsburgh, which has been in the course of erection for some months, has been completed, the first melt in the foundry having been made about ten days since. The plant is located on Butler and Sixtieth streets, on the Allegheny Valley Railway. The buildings, foundry, machine shop, &c., cover over an acre of ground. The foundry and machine shop are located in what is practically one building. This building is all iron and is most substantially constructed, and is admirably arranged as regards light and ventilation. The foundry is equipped with most modern appliances. Electric cranes traverse the entire length of the building, thus permitting easy and rapid handling of materials. The chief product of the new concern will be sand and chilled rolls, and in addition they will make rolling mill brasses and a general line of castings for rolling mill requirements. The officers of the Lincoln Foundry & Machine Company are Otis H. Childs, president, and James Kirkwood, secretary and treasurer.

The first shipment of copper from the large new copper plant at Salt Lake City, Utah, was made last week. It consisted of two carloads of 61,832 pounds' weight, one car of which went to a Chicago manufactory and the other to Pittsburgh.

A new cordage concern, under the title of the Western Twine Company, have been organized to undertake the speedy sale of the 20,000 tons of twine held by bankers as collateral security for loans to the old National Cordage Company.

The Pullman Palace Car Company.

The annual meeting of the stockholders of the Pullman Palace Car Company was held in Chicago on the 18th inst. Little was done except to re elect the directors and to declare the quarterly dividend of \$2 a share. The directors are: George M. Pullman, Marshall Field, J. W. Doane, Norman Williams and O. S. A. Sprague of Chicago, Henry C. Hulbert of New York and Henry R. Reed of Boston.

The financial statement for the year ending July 31 showed earnings of \$9,595,067.15, of which \$8,761,934.98 was for car rentals, \$6385.92 from patents and \$826,746.25 from interest and dividends. The disbursements amounted to \$7,274,650.25, of which \$2,880,000 was for dividends, and the surplus was \$2,320,416.90.

In the statement of assets, aggregating \$62,042,606.13, the following items are shown: Cars owned or controlled, total, 2588, \$29,522,124.54; Pullman plant, 505 acres, \$7,500,413.61; materials on hand, \$3,672,062.91; bonds, securities, cash and accounts, \$19,328,915.48.

The liabilities are thus scheduled: Capital stock, \$36,000,000; contingency reserve, \$1,155,310.49; depreciation account, \$1,100,000; income account, \$23,787,295.64, the last three items making a total of \$26,042,606.13 invested in the assets of the company.

In a supplemental statement President George M. Pullman imparts the following information to the stockholders:

The number of passengers carried during the year was 5,282,323, and the number of miles run was 197,409,503. During the previous year the number of passengers carried was 5,673,129 and the number of miles run 206,453,796. The year just ended shows, therefore, a decrease of about 7 per cent. in the number of passengers carried and of about 4 per cent. in the number of miles run. The value of the manufactured product of the car works of the company for the year was \$4,347,317.37, and of other industries, including rentals, \$578,014.28, making a total of \$4,925,331.61, against \$13,414,708.92 for the previous year. The total number of persons in the employ of the company in their manufacturing and operating departments is 10,858, and the wages paid during the year \$4,968,548.78. The number of employees for the previous year was 14,635, and the wages paid \$7,751,644.32.

The depression in the car building business, which began in 1893, manifested itself not only in a falling off in the prices for cars, averaging in all classes 24 per cent., but in such stagnation that the force in the Pullman shops on November 1, 1893, was less than 1100, while the average number employed in the fiscal year ending July 31, 1893, was 4497. In the months of August and September, 1893, we had an opportunity of making only six bids for work, of which but three were accepted.

In order to procure car building contracts a reduction of the wages of April, 1893, of the car shop employees averaging 19 per cent. was made to make them correspond with those paid by other car manufacturers, and by making bids at shop cost and less we secured work aggregating about \$1,500,000. On the accepted bids out net loss was over \$50,000.

After entering into a detailed statement of the company's position before and during the strike, Mr. Pullman continues:

The number of men now employed at

the shops is 2640, and the scale of wages now is the same as that existing at the time of the strike, and rents are promptly paid. As to the tenants who were not re-employed, none of them have been evicted or unduly pressed for arrearages of rent; there has been a gradual voluntary departure of unemployed tenants going on, as they have found work elsewhere, and there are now 279 of them remaining.

The real cause of complaint during the autumn of 1893 and the succeeding winter was not altogether on account of the scale of wages, but largely because there was not enough work to give an opportunity for anything like full earnings by all the men. The wages paid were in fact current wages in such trades, and substantially the same as at our Wilmington shops, where the attempt of the American Railway Union to cause a strike met with no concurrence on the part of the employees.

If the men had continued at work instead of remaining idle for nearly three months, wages amounting to more than \$350,000 would have been paid them, a sum to be contrasted with the total value of contributions made for them, which, so far as we are advised, did not exceed \$50,000.

I may observe also that there have been indications of a feeling in some quarters that this company ought to have maintained the scale of wages existing in the car manufacturing department in April, 1893, without regard to the current selling prices for cars, paying the consequent increased losses in the car building business out of the company's earnings in the independent business of operating sleeping cars, and thus sharing the sleeping car earnings with the car building employees who, to use the language of one questioner, "had been working for a long time." At the time of the strike 227 of the shop employees had been in the employment of the company for less than a year, and more than half the entire force had been with the company less than five years. Had all of them earned a guaranty of uninterrupted, undiminished wages? And if not, where was the line to be drawn, and what was to be done in respect to shop employees of varying terms of service who were laid off in the summer of 1893 for lack of work and who have not been re-employed?

By increased attention to their work the mechanics have under the same scale of piece work prices increased their average daily earnings from \$2.03 in last April to \$2.16 in the last half of September, the latest report received.

San Francisco News.

The effect of the reduction of the tariff on tin plate was felt in this city last week when the market receded \$1 a box on coke tin plate, being quotable to-day at \$4.40. However the reduction of the duty may be looked upon in other places, it is very generally favored in California, which of course does not now and never did produce any tin plate, but which is a large producer of canned fruits, and is interested in the great salmon canneries all along the coast from the Sacramento to the Yukon River. When the duty was put on it was in opposition to the protest of the people of this coast. It was argued that it would increase the cost of the canned product without any countervailing benefit. Owing to other causes it did not increase the price of any canned product of California, but that was accidental merely,

and it was all along felt as a grievance. As there is in some years a total of 300,000 boxes used on the coast, this means a reduction of \$300,000 on the cost of production. The value of the canned products of the coast reaches \$10,000,000 annually, so that this takes off about 3 per cent. It will make quite a material difference to some of our great packers, but it comes too late to do them any good for this year. But though this is the case there is, nevertheless, a feeling of satisfaction, and that among those who are sound enough on the principle of protection to every home industry of importance. A late arrival, the "California," brought to hand 9227 boxes, making total imports from January 1 to date 124,592 boxes, a comparatively small quantity.

It is an unpleasant task to have to record the failure of a worthy local industry; such, however, is my unwelcome duty. The Phelps Mfg. Company, who had for many years filled a useful and important position among our manufacturing institutions, have given up the struggle for the present at least. The works at Black Point in this city were devoted to the manufacture of the iron work used in cable roads, heavy forging iron work, and the iron work used in the construction of railroad cars and bridges. An assignment has been made to F. G. J. Margetson. No account has yet been set forth as to assets and liabilities. The embarrassed position of the company was a genuine surprise. The causes given were the general dullness of business and the difficulty of collecting many outstanding accounts. The Phelps brothers are well known in this city; one of them was formerly connected with the old iron and hardware firm of Thos. H. Selby & Co.

The reduced freight rates of the past year and a half have exposed many industries to an exhausting competition with the incomparably greater ones of the East, and during the transition period that must inevitably follow great hardship must result to many. The reduction of freight rates has the same effect on our local industries that the reduction of duties by the tariff has on the industries of the country at large, and the general dullness of trade has also operated to the prejudice of our manufacturers.

There has been a fairly good business enjoyed by our leading houses during the past couple of weeks, but the coming of the off season is making itself plainly manifest. The Clearing House exchanges as compared with those of 1893 at this time continue to show an increase, but then for a while a year ago business was practically suspended and wholesalers and jobbers were more intent on collecting their outstanding debts than aught else.

The heavy imports of iron pipe still continue by rail, while those of almost every other description of iron and hardware show a great falling off. There have, too, been some consignments of agricultural implements received by rail, although the market for anything of that description is about over for the year. There is nothing special to relate about pig iron. No imports by sea and those by rail very light. There has not been any change in prices last reported and there is not likely to be. In fact, demand here is almost at a standstill.

Five turret plates for the battleship "Maine," weighing 16 tons, were shipped last week by the Bethlehem Iron Company to the Brooklyn Navy Yard. Two

propeller shafts and two line shafts, weighing over 50 tons, were shipped to Cramp & Sons, and ballistic test plate weighing 22 tons for the battleship "Texas" to the Washington Navy Yard.

The Cahall Vertical Water Tube Boiler.

The Cahall vertical water tube boiler, manufactured by the Aultman & Taylor

waste gases. These gases, although reduced to a very low temperature in passing through the closely grouped tubes of the boiler, will impart most of their retained surplus heat to the metal sides of the passage through this upper drum, thereby tending to slightly superheat the steam in the chamber above. The water line in the upper drum is about 1 foot above the bottom of the drum, the drum itself being about 6 feet high in the clear inside, leaving a space of 5 feet between the surface of

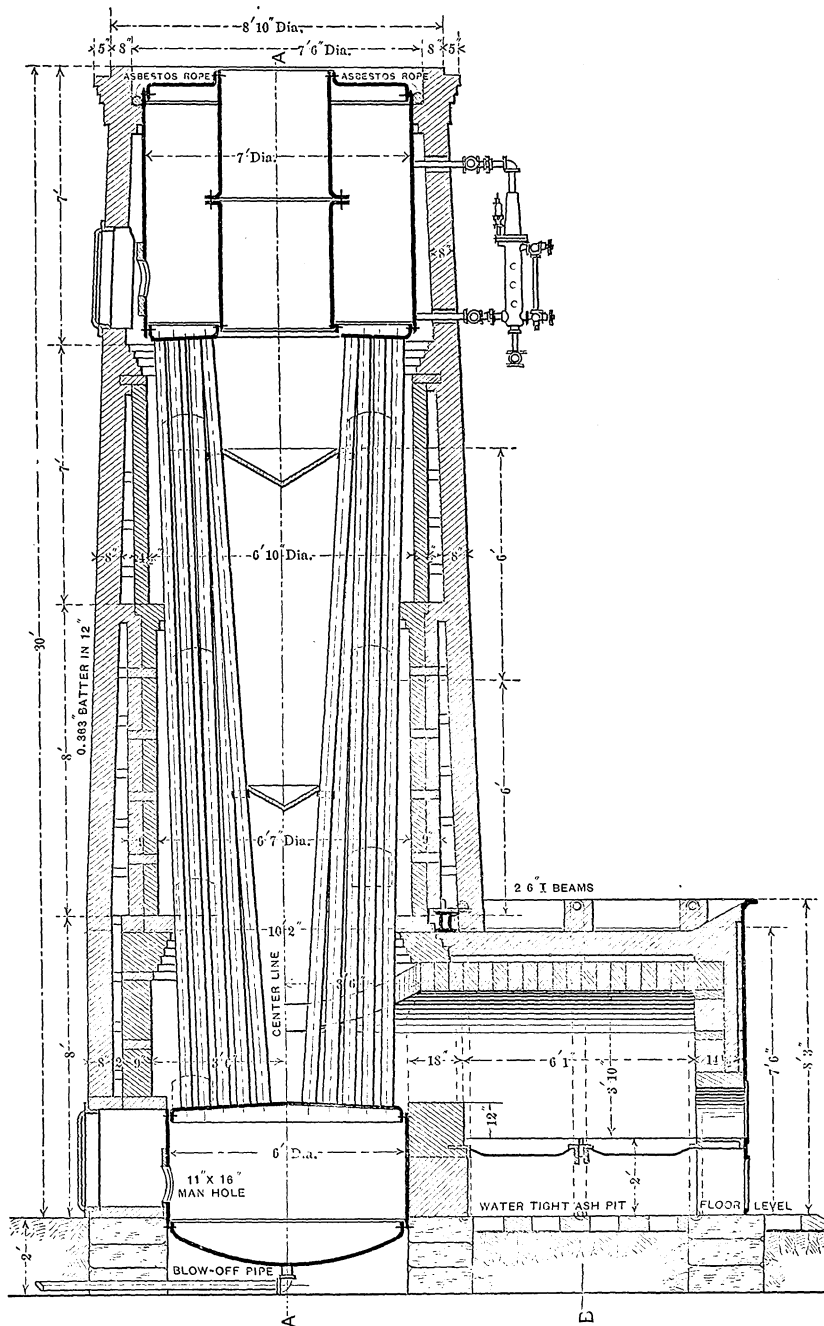
pipe and no possibility of making any, and there being in the tubes connecting the two drums steam in greater or less proportions, the result is a very rapid, positive circulation in one direction. The water in the tubes connecting the drums ascending to the steam drum delivers this mixture of water and steam there, whereupon the steam separating at once from the water, after traveling the space of 5 feet from the water level to the top of the drum, escapes, and the water which is left behind enters the circulating pipe and is carried down to the mud drum and again arises with its mixture of steam. It is claimed that as this mixture of steam and water coming from the upper end of the tube in the boiler is in about the proportion of half steam and half water in bulk, and as steam at 100 pounds' pressure will occupy about 218 times the space occupied by the water itself, the water in the boiler being thus delivered in the proportion of 218 parts water to one part steam in weight at the upper ends of the tubes will circulate through the boiler 218 times before finally becoming steam. This insures not only a rapid circulation, as mentioned, but also insures a uniform temperature of water in all the tubes. The boiler is thus relieved from any destructive strains arising from unequal expansion.

The boiler rests upon four iron brackets riveted to the lower or mud drum, supported upon four piers of the foundation, the entire structure standing without contact with the brick work, thus allowing the boiler every freedom for expansion without in any way straining the brick setting. In all places where pipe connections are made to the boilers through the walls, they are incased in expansion boxes.

Owing to the fact that the gases escape through the central opening in the upper drum, the upper tube sheet has a circular opening in its center, leaving a central open space between the tubes, which gradually narrows to the bottom tube sheet. Advantage is taken of this space, which is in the form of an inverted cone, to introduce deflecting plates, which cause the gases to be alternately thrown out and in throughout the whole heating surface, giving them a sweep at nearly right angles to the tubes, thereby extracting from these gases their heat, until they come to very nearly the temperature of the water contained in the boiler. This construction insures the rapid absorption of the heat and a consequent economical performance.

The space occupied by each 250 horse-power boiler, set in continuous battery, will be about 9 feet front for each boiler, by 17 feet long, which is less floor space than occupied by any other boiler built. The upper, or steam drum, and the lower, or mud drum, of the boilers are equipped with the Cahall patent swinging man head. By taking off the nuts from the man heads (which are on hinges) and swinging them open, a man can place a light in the lower drum of the boiler and get into the upper drum, and can in a short time examine the condition of every tube in the boiler. In case scale or sediment is discovered in any of them a scraper can be run through the tubes. In the Republic Iron Works of Pittsburgh the boilers have been in use for about two years, and they have not as yet found it necessary to introduce a cleaner into a single tube.

It will be seen that from the arrangement of the tubes in this boiler any scale that might loosen will at once fall through the tube to the mud drum in



THE CAHALL VERTICAL WATER TUBE BOILER.—VERTICAL SECTION.

Machinery Company, Mansfield, Ohio, for which H. E. Collins & Co., Bank of Commerce Building, Pittsburgh, Pa., are sole agents in the United States, consists mainly of two drums arranged one above the other, a distance of, in the 250 horse-power size, 24 feet apart and connected with $4\frac{1}{2}$ inch lap welded best charcoal iron tubes. These tubes are vertical, are perfectly straight throughout their entire length, and are expanded into the drums at each end. The upper or steam drum has an opening through its center for the exit of

the water and the point at which the steam is drawn off from the boilers, thereby precluding any possibility of the carrying over of any water in the steam, either in the form of supersaturation or mechanical entrainment.

An external circulating pipe comes out from the upper or steam drum just below the water level and is carried downward outside the brick work to a point just below the tube sheet of the lower drum, where it enters that drum. There being no steam whatever in this external circulating

the bottom, and if small enough can be readily blown out through the blow off pipe; if too large to be blown out it can be easily removed through the man hole on regular cleaning day. As the entire lower drum is removed from direct contact with the fire, the presence of scale in this drum can act in no way to the detriment of the boiler; the fire not being in contact with the drum it would not burn, even were the drum allowed to become half filled with scale.

Owing to the external combustion chamber, roofed with a heavy fire brick arch which becomes incandescent shortly after the boiler is fired and radiates directly on top of the green coal its intense heat, the boiler can be operated with a minimum amount of smoke. Owing to the direct upward passage of all gases and full free openings, a comparatively short stack will provide all the draft necessary. In a test recently made with a stack only 50 feet high a draft pressure in the furnace of over $\frac{1}{2}$ inch was attained.

The Casting Temperature of Soft Steel.—II.

Let us now proceed to a study of the first kind of hot heats mentioned, heats in which the excess of temperature is absolute, not apparent. Subsequently, in speaking of a hot heat, we shall understand the term to apply only to heats with normal analyses as evidenced by the test ingots and within the limits of soft steel.

Hot blowing and casting has at the outset one decided advantage over medium casting because of the decreased loss by conversion and absence of ladle skulls in the former case. Hot steel, in the molten condition, possesses many of the characteristics of high phosphorus steel, although in a lesser degree. The metal rises in the molds considerably, gives off copious sparks and boils vigorously; but it has a soft white color instead of the glassy yellow of phosphoric steel. Again, soft steel, however hot, does not act nearly so aggressively upon the linings, stoppers, molds and stools.

Hot heats may be detected at once by the forge tests. The bending tests break at various angles and the fractures incline always to the crystalline. A novice can make no distinction between tests of a hot soft heat and tests of a high phosphorus heat; but the experienced blower is not misled by the crystalline nature of the fracture, nor by the short arc of the bend. The physical tests from a hot soft heat show a large coarse grain as distinguished from the finer grain of phosphoric steel, and show a silvery luster as opposed to the penetrating glitter of high phosphorus tests. In the early days of the basic process in America the physical tests were taken as representing the finished material chemically and physically. Later experience has demonstrated, however, that although the physical tests are valuable in determining the chemistry of the steel bath, they do not mirror the ultimate physical constitution except when the steel is cast at a medium or low temperature. As will be shown shortly many a good soft heat, cast hot, would have been condemned at once by the forge tests when the tensile tests have afterward proved the material to be of the finest quality.

In considering the effects of high casting temperature on the ingots and

blooms produced, and on the fracture, ultimate strength and elongation of the tensile tests, we enter upon ground which is to some extent controversial. Many there are who assert that high casting temperature produces evil effects in steel which are retained in subsequent treatment even to the finished plate. The statements made against hot casting are not very definite, but the general idea seems to be that the steel resulting is rotten or cold short, the ingots are scabby, pitted or cracked and the blooms blistered or scabby; while the tensile tests show poor elongation, low ultimate strength and often a crystalline or granular fracture, the finished plates being, perhaps, pitted or snaky. It has not been the intention in this article to discuss the effects of a low or medium casting temperature at so great a length as the effects of high casting temperature. The data relative to medium casting temperature are more extended than that relative to high casting temperature and fully warrant any assertions that have been made in regard to medium casting. On the other hand, low temperature data, while not even so available as that for high temperature, justify quite as fully whatever statements have been made under the head of low casting temperature. In neither case, so far as the writer knows, has there been announced any departure from accepted beliefs. The subject of high casting temperature and the effects of hot heats seem worthy, however, of more detailed study. The testimony here brought to bear upon these points, from which impartial inferences may be drawn, consists of several series of blows, described in the short paragraphs succeeding. The few writers who have contended that high casting temperature is not always so visibly ruinous in its effects may find some confirmation of their views in the conclusions which may justly be inferred from a consideration of these heats.

1. Fifty-five typical hot heats, with a complete record of forged and tensile tests, condition of ingot surfaces and condition of bloom surfaces. These heats were blown without any scrap additions in the converter and with only sufficient lime to insure dephosphorization. They were intentionally so blown to see what quality of steel would be produced without scrapping.

2. Two hundred and seventeen heats which showed defective ingots. These heats were traced back to the converting mill, to determine in how many cases defective ingots were associated with high casting temperature.

3. Two hundred and thirty-four heats which yielded each one or more defective blooms, the defects being of such a character as to necessitate cutting up the plates rolled therefrom. These heats were traced back to the converting mill in order to determine in how many cases defective blooms were associated with high casting temperature. No defective ingots or blooms due to overheating and burning of ingots in the soaking pits are considered.

4. Two hundred and six heats showing one or more bad fractures in the tensile tests—i.e., spongy, granular, laminated or crystalline fractures, or fractures with hard spots. These heats were also traced back to the converting mill in order to determine in how many cases bad tensile fractures and high casting temperature were associated in the same heat.

5. Finally, 30 hot heats taken at random, and followed through to the tensile tests, to determine whether the de-

ductions arrived at by the investigation of the foregoing series would hold true when applied to other hot heats.

1. Summary of data for 55 hot heats, showing effects of high casting temperature—bends and fractures of physical tests:

35 heats produced fractures 90 per cent. crystalline.
11 heats produced fractures 50 per cent. crystalline.
5 heats produced fractures 75 per cent. fibrous.
1 heat produced fractures 90 per cent. fibrous.
3 heats had no tests.
8 heats produced bends of 180° flat.
3 heats produced bends of 180°, cracked.
2 heats produced bends of 180° around 1-inch pin.
16 heats produced bends of 135°.
12 heats produced bends of 90°.
9 heats produced bends of 45°.
2 heats produced bends of 30°.
3 heats had no tests.
Average bend for 52 heats, 116°.

The average analysis of the 55 heats was: Carbon, 0.091 per cent.; sulphur, 0.055 per cent.; phosphorus, 0.045 per cent.; manganese, 0.394 per cent. The maximum carbon was 0.11 per cent.; maximum phosphorus, 0.07 per cent., and maximum manganese, 0.64 per cent.

The 55 hot heats produced, out of a total ingot yield of 239, but 8 ingots which were scabby, cracked, pitted or otherwise defective. They produced also 9 cracked, laminated or pitted blooms, the total bloom product being about 12 per heat. But 1 heat produced both bad blooms and bad ingots.

Forty-nine tensile tests were pulled from these 55 hot heats. Of this number, 2 showed crystalline fractures and 1 a granular fracture; all other fractures were silky. But 4 tests out of the 49 showed an elongation of less than 20 per cent. in 8 inches. Forty-four bends were made on the fractured test pieces; 40 bent 180° flat, 1 bent 180° flat with a slight crack, and 3 bent 180° around a 1-inch pin.

In all heats except 2 the molten steel rose in the molds; in 3 heats the steel rose abnormally. Only 3 analyses of tensile tests were made, the first showing segregation of carbon and phosphorus, the second of carbon, and the third no segregation, when compared with the analyses of the 4-inch tests corresponding to the same heats.

Unfortunately, no record was ever kept in this or in the other series of the surface condition of the finished plates. Testimony on this point would be invaluable in our discussion, completing the last link in the chain of investigations of hot cast steel throughout its further treatment.

From the above summaries it seems clear, that for these 55 hot heats at least, the effects of high casting temperature were not traceable beyond the physical tests. Blooms, ingots and tensile tests were similar to those in medium steel. The indications of crystalline structure and brittleness exhibited in the physical tests were almost entirely obliterated by the further work put upon the steel, and the finished plates were soft and fibrous.

2. Summary of data for bad ingots. The results are best brought out by a comparison of the numbers of cold, warm, medium and hot heats which apparently caused defective ingots:

10 cold heats,	} produced one or more ingots with bad ends.
11 warm heats,	
55 medium heats,	
21 hot heats,	
7 cold heats,	} produced one or more scabby ingots.
8 warm heats,	
12 medium heats,	
6 hot heats,	
6 warm heats,	} produced one or more scabby, pitted, hollow, cracked or ragged ingots.
28 medium heats,	
12 hot heats,	

1 cold heat,	} produced one or more defective ingots, defect not specified.
2 warm heats,	
22 medium heats,	
9 hot heats,	
Totals:	
18 cold heats,	} produced defective ingots.
27 warm heats,	
117 medium heats,	
48 hot heats,	

Cold heats, being poured with the slag over the side of the casting ladle, naturally yield many bad ingots per heat. But warm, medium and hot heats produce bad ingots in about the same ratio as the heats themselves occur in practice. In other words, the poor ingots are proportionally distributed among the warm, medium and hot heats. This fact argues strongly against the supposition that any particular casting temperature (except a cold one) influences the condition of the ingots more than another. It indicates, rather, that some element of manipulation or chemistry is the determining factor—most probably the former. Bad ends on ingots, the most frequent defect, are almost always due to poor practice in handling while casting at the pit, or subsequently, in capping the ingots. If care be taken hot and medium heats can always be cast into ingots with sound tops, and only the colder heats give any excuse for scrappy ends.

3. Summary of results on 234 heats showing defective blooms. Comparison of the bad bloom product of hot and medium heats, Table VII.

Table VII.—Comparison of the Bad Bloom Product of Hot and Medium Heats.

Number of hot and medium heats.	Number of blooms produced, with defect.	Average number of defective blooms per heat.
50 medium.	90 scabby.	1.80
22 hot	31 scabby.	1.41
53 medium.	71 cracked.	1.34
14 hot.	16 cracked.	1.14
44 medium.	65 laminated.	1.48
19 hot.	24 laminated.	1.26
16 medium.	30 { pitted.	1.88
8 hot.	8 { hollow.	1.00
	8 { blistered.	
	8 { ragged.	
TOTALS.		
163 medium.	256 defective.	1.57
63 hot.	79 defective.	1.26
8 warm.	12 defective.	1.50

Reviewing, it may be seen that not only do hot heats produce in the aggregate fewer defective blooms than medium heats, but also that no specific defect in blooms is to be attributed to hot heats more than to heats cast at some lower temperature. Neither scabby, laminated nor cracked blooms are associated more frequently with hot heats than with medium heats.

4. Bad fractures in tensile tests; study of 206 heats in which the tensile tests, when broken, showed one or more poor fractures per heat.

The ruptured ends of tensile tests may appear silky, crystalline, granular, laminated, spongy, or with hard spots. Such fractures may be due to a number of causes other than the original casting temperature of the steel. The finishing temperature of the plate, the thickness of the plate, the chemical composition of the test at the point of rupture, may all operate to produce abnormal fractures in the test. In the following summaries high casting temperature was always given the preference as the probable cause of bad fractures.

When poor fractures occurred in the tests of other than hot heats, a cause was sought in high finishing temperature, in the thickness of the plate, or in the analysis of the test piece. If no probable cause could be found under any of these heads the tests were classed as "cause, doubtful." Thick plates give crystalline or spongy fractures, because of the high finishing temperature of the interior portions of the plate. Chemical composition, due to excessive segregation, may cause bad fractures, because of the lower melting point and consequent relatively higher finishing temperature when the metalloids are present in abnormal quantities in the steel.

Causes of 116 fractures which were more than 20 per cent. granular or crystalline, with number of tensile tests under each cause:

	Tests.
Doubtful.....	9
Finishing temperature.....	5
Segregation.....	23
Thickness of plate.....	22
High casting temperature.....	57

Of the 57 granular or crystalline tests, presumably due to high casting temperature, 18 may have been due to segregation, thickness of plate or high finishing temperature, as one of these conditions was, in 18 cases, concomitant with high casting temperature. Of the remaining 35 cases of crystalline or granular fracture, 17 were accompanied by at least 3 other silky fractures from test pieces of the same heat, leaving but 18 cases out of a total of 116 in which the probable cause of bad fractures in tensile tests was high casting

	Tests.
Segregation.....	2
Cold heat.....	2
High casting temperature.....	16
Doubtful.....	24
Finishing temperature.....	2

Spongy fractures, hard spots and laminations in tensile tests appear to be oftenest associated with a previous high casting temperature. A lamination is here understood to mean a layer of metal of another structure showing in the fracture, which may or may not be perfectly welded to the surrounding metal. Numerous analyses on basic Bessemer material have shown such laminations to be due to segregation, probably induced by high casting temperature. A great difference between the chemical composition of the inner and outer layers is nearly always found, thus bearing out the observations of Pourcel. Spongy fractures probably represent a condition half way between crystalline and silky. The same causes operating to produce crystalline fractures, would, when present in lesser degree, produce spongy fractures. Fractures with hard spots might result from irregular heating of the blooms, from irregular distribution of the metalloids from some cause, or from finishing temperature.

Before proceeding to review the deductions gathered from a study of the four series of blows already considered, and before applying these deductions to the fifth or test series of blows, some figures will be given as to the influence of hot heats or high casting temperature upon segregation. In presenting the following examples of segregation in hot soft steel (Table VIII) it must be

Table VIII.—Analyses Showing Extent to which Segregation May Occur in Hot Soft Heats.

Blow number.	Analysis of 4-inch test ingot.			Number of tests analyzed.	Analyses of retests.					
	Carbon.	Phosphorus.	Manganese.		Maximum carbon.	Minimum carbon.	Maximum phosphorus.	Minimum phosphorus.	Maximum manganese.	Minimum manganese.
A3.....	0.12	0.050	0.320	15	0.16	0.09	0.110	0.035	0.328	0.280
B3.....	0.08	0.060	0.275	15	0.12	0.08	0.135	0.050	0.250	0.180
C3.....	0.09	0.055	0.325	15	0.13	0.08	0.120	0.055	0.344	0.240
D3.....	.....	.....	.....	9	0.14	0.06	0.105	0.030	0.231	0.108
E3.....	0.08	0.035	0.270	6	0.12	0.07	0.115	0.045	0.560	0.365
F3.....	0.07	0.035	0.270	8	0.10	0.07	0.105	0.030	0.465	0.240
G3.....	0.07	0.085	0.411	5	0.10	0.07	0.095	0.050	0.466	0.401

temperature. Many of these 18 tests were not analyzed, and we have no means of knowing in how many cases segregation may have occurred to an extent great enough to have caused crystalline fractures.

Apparent causes of spongy fractures in 32 tensile tests, with number of tests under each cause:

	Tests.
Segregation.....	1
High casting temperature.....	8
Thickness of plate.....	4
Finishing temperature.....	4
Doubtful.....	15

Apparent causes of hard spots in the ruptured ends of 28 tensile tests, with number of tests:

	Tests.
High casting temperature.....	13
Finishing temperature.....	9
Doubtful.....	6

Apparent causes of 46 laminated tensile fractures, with number of tests under each cause:

remembered that heats here quoted are extreme cases and do not at all reflect the average amount of segregation occurring in hot heats. Many other re-analyses of hot heats could be selected showing an entire absence of segregation, or showing that segregation has operated to a limited extent only. But as any very hot heat may, under certain conditions, exhibit the phenomena of segregation to a great extent, the examples cited, occurring in actual practice, will serve to demonstrate what may sometimes be expected when casting even very soft steel at a high temperature.

In order to discover exactly how much segregation occurred in several hot heats, the writer caused test slabs to be cut from those heats during blooming. The slabs so obtained were then drilled into from the rolled surface. When the drill had penetrated 1/2 inch the first sample, number 1, was

taken; at 1 inch number 2 sample was taken, and when the drill had reached the center of the slab, number 3 sample was taken. In Table IX is summarized the results obtained by analysis of the different sets of drillings, together with the original analysis of the 4-inch test ingot. Thirteen heats were thus sampled, but 7 of which, given in the table, showed any noticeable segregation.

Table IX.—Segregation in Hot Heats.

Tests.	Blow number.	Analysis.		
		Carbon.	Phosphorus.	Manganese.
4-inch test.....	11,739	0.08	0.070	0.223
Slab test 1.....		0.08	0.040	0.323
Slab test 2.....		0.09	0.085	0.335
Slab test 3.....		0.11	0.080	0.343
4-inch test.....	11,768	0.11	0.105	0.450
Slab test 1.....		0.09	0.090	0.460
Slab test 2.....		0.10	0.110	0.485
Slab test 3.....		0.13	0.105	0.495
4-inch test.....	11,774	0.13	0.125	0.500
Slab test 1.....		0.14	0.150	0.525
Slab test 2.....		0.14	0.080	0.540
Slab test 3.....		0.14	0.170	0.525
4-inch test.....	11,843	0.09	0.080	0.420
Slab test 1.....		0.09	0.050	0.410
Slab test 2.....		0.10	0.065	0.378
Slab test 3.....		0.11	0.105	0.395
4-inch test.....	11,849	0.10	0.080	0.343
Slab test 1.....		0.10	0.045	0.380
Slab test 2.....		0.11	0.045	0.380
Slab test 3.....		0.12	0.090	0.390
4-inch test.....	11,857	0.11	0.065	0.480
Slab test 1.....		0.10	0.030	0.425
Slab test 2.....		0.13	0.065	0.440
Slab test 3.....		0.14	0.080	0.440
4-inch test.....	11,873	0.09	0.075	0.305
Slab test 1.....		0.07	0.080	0.260
Slab test 2.....		0.07	0.090	0.280
Slab test 3.....		0.08	0.135	0.300

From all the foregoing the conclusion seems justifiable that, in basic Bessemer practice, but one principal objection may be urged against hot heats. The objection referred to is the evil consequences of segregation, most apparent in hot heats because of the duration of fluidity. Whatever the physical constitution of the ingots or blooms, the subsequent reheating from the cold appears to act effectively as an annealing process. If the finishing temperature of the plate is good, and if segregation be not excessive, the steel physically will be tough and fibrous at the end of its treatment, however hot it was cast. In the direct rolling of plates from ingots advantage is often taken of this principle by allowing the ingots to become perfectly cold before reheating for rolling into plates.

The same apparent annealing effect may be produced in the 4-inch test ingot cast from the heat. In the subjoined series of tests (Table X) the 4-inch test ingot was forged down to 1½ inches, and one portion allowed to cool off in the open air, while another portion was forged down to ¾ inch in the one heating, bent and nicked and broken. The cooled off portion was then reheated, forged down to ¾ inch, bent and nicked and broken. Table X shows the bends and fractures after the first heating, the bends and fractures after the second heating and the analysis of the material. The bends are greatly improved by the second heating, the fractures but slightly.

The questions raised by the phenomena of segregation are to-day under discussion by steel experts, and the objectionable features resulting from its ac-

tion are being more and more clearly noted. In basic Bessemer practice the choice is given of running regularly warm, with accompaniment of unavoidable heavy conversion and scrap loss, or of running regularly medium to hot with a lower loss, but with occasional segregation in the hotter heats. Phosphorus is the element which segregates most markedly, with sulphur or carbon coming next in order and manganese least. In good basic blowing sulphur should be a nearly fixed quantity, not exceeding 0.05 per cent. in the steel and phosphorus should run from 0.03 to 0.05 per cent. If the phosphorus be much lower than 0.03 per cent. the steel tends to congeal more rapidly and to interfere with smooth casting. The loss by oxidation in the converter is also increased in the case of extra soft heats. If the sulphur and phosphorus in the steel are within the above limits, segre-

Table X.—Physical Tests Forged Out in One and in Two Heatings.

Blow number.	Bend, with one heating.	Fracture, with one heating.	Bend, with two heatings.	Fracture, with two heatings.	Analysis.			
					Carbon.	Sulphur.	Phosphorus.	Manganese.
A4.....	135°	Fibrous	180°, flat.	75 % fib.	0.10	0.048	0.040	0.555
B4.....	90°	90 % crys.	180°, flat.	90 % crys.	0.08	0.055	0.055	0.363
C4.....	45°	75 fib.	180°, flat.	90 % crys.	0.07	0.051	0.050	0.325
D4.....	45°	90 crys.	180°, flat.	75 fib.	0.07	0.051	0.040	0.365
E4.....	45°	90 crys.	180°, cracked.	90 % crys.	0.10	0.052	0.080	0.493
F4.....	45°	90 crys.	180°, cracked.	90 % crys.	0.09	0.052	0.080	0.398
G4.....	45°	90 crys.	180°, cracked.	75 fib.	0.09	0.052	0.040	0.520
H4.....	90°	90 crys.	180°, flat.	75 fib.	0.07	0.051	0.040	0.423
I4.....	45°	90 crys.	180°, flat.	75 fib.	0.09	0.051	0.040	0.518
J4.....	45°	90 crys.	180°, flat.	75 fib.	0.09	0.051	0.040	0.733
K4.....	90°	75 fib.	180°, flat.	90 % crys.	0.08	0.051	0.025	0.542
L4.....	180°, broke.	50 fib.	180°, flat.	Fibrous.	0.09	0.045	0.045	0.368
M4.....	90°	75 fib.	180°, flat.	90 % crys.	0.10	0.075	0.025	0.600

gation is not nearly so liable to occur, especially if the hotter heats be given a dose of scrap in the converter. Even if the phosphorus in the steel should run as high as 0.08 per cent., the wise addition of heavy plate scrap or small billet scrap in the converter near the end of the blow should lower the temperature of the bath sufficiently to insure the avoidance of marked segregation. In basic practice, at least, it is much better to add a fixed amount of steel scrap in the converter for every blow, instead of endeavoring to scrap each heat to the delicate point where the steel will just run clean from the ladle, or leave a small skull. Nearly all cold heats in Bessemer practice are produced by over-scraping. It has been found advantageous in basic blowing to add scrap in quantities of 500, 1000, 1500 or 2000 pounds. Suppose 1000 pounds is being charged, then no change is made in this quantity unless the heats become colder, when it may be decreased to 500 pounds, or unless the heats become much hotter, when it may be increased to 1500 pounds. The variations in temperature are always to be judged at the casting pit and not by the flame or smoke. By such procedure the occurrence of cold heats may be entirely avoided and the number of warm heats made reduced to a minimum, while hot heats appear in no greater excess than in warm to medium running. A charge of 1000 to 2000 pounds of steel scrap in the converter near the end of the blow will, in the greatest majority of cases, effectually check the tendency toward subsequent segregation in the ingots, even if the heat be unusually hot and even though the heat would have stood 3000 or 4000 pounds of scrap.

Summary.

The following five propositions embody the conclusions reached in the preceding study of temperature phenomena and effects:

1. Hot heats, or a high casting temperature, produce rising molten steel and brittle physical tests.
2. High casting temperature does not cause an excess of bad ingots.
3. High casting temperature does not produce excess of defective blooms.
4. Hot heats probably do not, by virtue of their high casting temperature, produce bad fractures or poor elongations in tensile tests. The second heating to which the blooms are subjected appears to have an annealing effect. (Evidence given by tensile tests is not so conclusive as to justify a positive assertion that high casting temperature, independent of segregation, exerts no influence on finished plates. The evi-

dence, however, does point strongly to this conclusion.)

5. Hot heats may segregate badly, thereby sometimes yielding plates, the tensile tests from which show high ultimate strengths and poor elongations, with, perhaps, crystalline or granular fractures.

These propositions, when applied to the series of 30 hot test heats, gave results as follows:

First.—The physical tests were thus classified as to fracture:

Fractures entirely fibrous.....	0
Fractures 75 per cent. fibrous.....	4
Fractures 50 per cent. crystalline.....	12
Fractures 90 per cent. crystalline.....	14

Degrees.	
5 tests bent.....	180
5 tests bent.....	170
7 tests bent.....	135
7 tests bent.....	90
4 tests bent.....	45
1 test bent.....	30
1 test bent.....	15

Average bend.....118

Second.—Of the 30 heats cast at a high temperature, 13 had no record of the surfaces of ingots. The remaining 17 heats all produced sound ingots.

Third.—No record of blooms was preserved for 13 heats. Of the remaining 17 heats, 5 produced each 1 defective bloom. The average number of blooms cut from a heat is about 12, making a total bloom product of about 204 for 17 heats. Hence of these 204 blooms but 5 were defective.

Fourth.—The tensile tests of the series were, without exception, normal as to fracture, being all silky. Six heats, however, showed variations in ultimate strengths, when several tests were pulled on different plates from one heat. This variation in ultimate strengths was presumably due to vary-

ing chemical composition, which in turn was due to segregation. Five heats yielded tests showing an elongation in 8 inches of less than 20 per cent., the lowest elongation being 17 per cent.

Fifth.—Segregation occurred in 19 heats upon which analyses had been made subsequent to the analysis of the 4-inch test ingot. But two heats having analyses of tensile tests showed no segregation. In many cases the segregation was very marked, as the analyses in the following table bear witness.

Table XI.—Analyses Showing Segregation in Hot Heats.

	C.	S.	P.	Mn.
Mother metal.....	0.10	.....	0.035	0.385
Tensile test.....	0.15	0.063	0.095	0.395
Mother metal.....	0.10	.....	0.050	0.500
Tensile test.....	0.13	0.095	0.120	0.530
Mother metal.....	0.07	.....	0.075	0.470
Tensile test.....	0.15	0.077	0.080	0.435
Mother metal.....	0.11	0.058	0.075	0.580
Tensile test.....	0.11	0.035	0.030	0.340
Tensile test.....	0.12	0.055	0.180	0.550
Mother metal.....	0.12	.....	0.065	0.640
Tensile test.....	0.13	0.088	0.165	0.795
Mother metal.....	0.10	0.065	0.040	0.345
Tensile test.....	0.12	0.090	0.075	0.370
Mother metal.....	0.12	.....	0.050	0.485
Tensile test.....	0.16	0.114	0.050	0.600

The five propositions appear to hold true. The application of the fifth

purpose, quite forgetting that for every failure there are a greater number of successes in the same line, and of which they do not so readily hear.

The cause of variation in the qualities of steel tubes lies principally, if not wholly, in the manufacture of the ingot from which the skelp is rolled, and just so surely as the makers will try to run the basic Bessemer product on account of its lower first cost, just so surely will the results be non-uniform and in general very unsatisfactory. There can be no form into which steel can be made which will test more severely the uniformity of the metal, both chemically and physically, than that of a boiler tube. Here the metal is rolled out into very thin sheets of great proportional length and exposed to the action of variously impregnated waters as well as to constantly changing temperatures between wide limits. Obviously the most potent factor in its length of life under such circumstances must be its uniformity, as one small flaw or one slight imperfection will start pitting and soon render the entire tube useless.

It appears to be well proven that while the basic Bessemer process does give us mild steel of very great excellence for many purposes, it is, nevertheless, liable to vary considerably in chemical composition in different parts of the same ingot. In other words, the element of time wherein the added "spiegel" and "ferro" have to mingle with the entire mass of molten metal in the converter is so

ingots, the first inspection comes when the skelp has been rolled into the long pieces of tubing from which generally two ordinary tubes are finally cut. Before cutting, and before any further work is done upon them, a number are selected from the pile—say, 1 in 20—from which sample sections are cut for the tests of the material; four 3-inch sections and one 1-inch section being taken from each of the selected tubes, and the samples from each tube kept in a separate group. From each group one 3-inch section is flattened down under a steam hammer by laying it on its side, and from these are cut several $\frac{1}{4}$ inch strips for the quenching test, while the end strips, showing the bend (see piece on top of Fig. 2) are serviceable in judging of the grade of the metal. The quenching test consists in heating the $\frac{1}{4}$ -inch strips to a cherry red and suddenly cooling them in tepid water and then bending them double, while cold (see piece leaning against Fig. 3). They must not show the slightest cracking at the bends.

Next come the flanging tests (Figs. 3 and 4), where a 3-inch section from each group is flanged, cold, at right angles, and another turned over, as

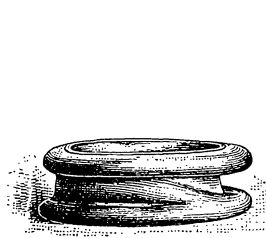


Fig. 1.

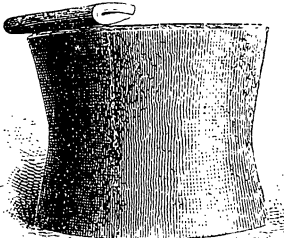


Fig. 2.

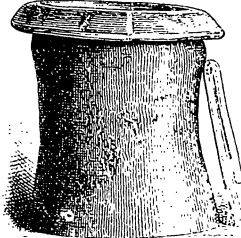


Fig. 3.

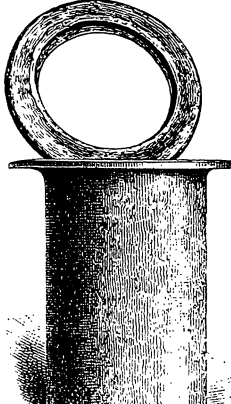


Fig. 4.

STEEL BOILER TUBES AND THEIR TESTS.

proposition but emphasizes the fact that segregation in hot heats is almost sure to occur to a greater or less extent.

Steel Boiler Tubes and Their Tests.

In cases where difficulties have been encountered by any particular manufacturer in producing steel boiler tubes which will stand the severe tests given them by the inspectors, the tendency is to return to good charcoal iron tubes in order to feel assured of securing a satisfactory article. Frequently we hear both maker and consumer say: "After all there is nothing as reliable as good charcoal iron for boiler tubes," and the people who are familiar with the manufacture of both kinds are usually better pleased themselves to make the iron ones.

It is an error, however, pure and simple, to presuppose inferior qualities for the steel tubes, as a class, and their unfair criticism comes from those who do not take the time to look carefully into the matter to discover how many steel tubes really are giving every possible satisfaction in use. These critics base their opinions upon some particular case of failure and hastily condemn the use of steel for any such

short as to preclude the possibility of that absolute homogeneity which is here so essential; whereas in the basic open hearth process the whole operation is conducted with a deliberation which permits of an almost perfectly uniform product. Analysis of simple samples will not always show this difference, for to do so would require the analysis of many samples from the same ingot, which is not a usual proceeding, and indeed it is quite remarkable how very similar the analysis of the single test pieces from the two different processes may be and yet the action of the metal in use be very dissimilar. Experiments seem to conclusively show that the Bessemer will not weld as well as the open hearth—this even when the physical test of the former gives better results, and the carbon and sulphur in each identical. Generally there is more phosphorus left in the Bessemer steel, and this may have a strong influence.

The tests given by the Government inspectors are as follows and certainly render the acceptance of inferior tubes very nearly impossible. They also stand in the way of the makers' great profit, but this should be estimated upon when making bids. After witnessing the operation of making the steel and securing a fair chemical analysis of the

shown. They must not show any splitting. Fig 1. shows a 3-inch section crushed axially, for distortion, and the piece on top of Fig. 4 is a 1-inch section also crushed axially into a flat ring.

The test of the welds is the most severe. Either the end of a selected tube or else a 3-inch section is heated to a cherry red and into its bore is driven a heated taper mandrel until the diameter is from one and one-eighth to one and one-quarter times the original diameter. The weld must not show the least sign of rupture.

After these tests the tubes are cut into proper lengths and the ends swelled as required, or in the case of stay tubes, upset or safe ended and threaded. They are then examined again for surface defects, and if passed are given a final hydraulic test to see that the weld at the ends has not suffered by the work done there. The ends are then annealed, and each tube is marked as passed, by the inspector.

There is no doubt but that some inspectors have condemned tubes of good quality, through the severity in which they apply the tests. Excellent judgment is required and all inspectors are not equally blessed with that quality. Hence in order to give steel a fair chance, the makers, when they feel that they have not received fairest treatment,

should insist upon a second inspection, by another inspector, and not allow the *ipse dixit* of one man to throw out a lot of tubes which they are convinced are first class.

An average result of a chemical analysis of the tubes from which the samples here shown were taken is: Carbon, 0.008; sulphur, 0.046; phosphorus, 0.025, and manganese, 0.487.

Labor in France.

The recently published report to the State Department of Stephen H. Angell, United States Commercial Agent in France, shows the condition of labor in that country to have been in some respects even worse than in our own during the summer. Quoting the figures of the Central Labor Bureau in Paris, Mr. Angell shows that a very large proportion of workmen were without employment in the month of August last. From 645 labor unions, representing a membership of over 129,255, reporting at the central office, it is shown that about 14.4 per cent. of all the laborers of the country are still without employment. Of these unions 53 report the situation to be worse than it was one year ago. In the agricultural districts over 67 per cent. of the laborers are still without work, and in the wine districts this percentage is increased to about 80 per cent. The report enters fully into the condition of the workingman in all branches of trade and industry, and makes a startling exhibit of the extent of the industrial depression in France.

Fuel for the Navy.

The cost of fuel for the ships of the United States Navy is set forth in the annual report of the Chief of the Naval Bureau of Equipments as having been \$191,291 last year in excess of the year preceding, on account of the increased activity of the navy, due to the Brazilian, Salvadorian, Mosquito Coast and Hawaiian troubles. During the past year there were purchased at home 42,190 tons of coal, costing \$178,163, of which quantity 9505 tons were purchased on the Pacific Coast at an average cost of \$7 per ton and 32,685 tons on the Atlantic Coast at an average cost of \$3.33 per ton. There was expended abroad \$462,192 for 52,146 tons of coal, an average cost per ton of \$8.86. Of a total of 56,722 tons of coal used by the new ships of the navy during the year, 40,521 tons, or 71 per cent., were for steaming purposes and 16,201 tons, or 29 per cent., were for auxiliary purposes, including electric lighting, distilling, heating, flushing, cooking, ventilation and steam cutter service.

A building for the manufacture of copperas has been completed and put in operation in connection with the nail mill of the Salem Wire Nail Company, Salem, Ohio. Heretofore the waste from the rod mill has been turned into the county ditch and lost, besides causing danger to the public health and killing the fish in the waters where it ran. By the new arrangement, however, the waste is caught in a large cistern, holding about 9000 gallons, and a fine quality of copperas will be made from it.

Engineer-in-Chief Melville, in his annual report, recommends that the Boston Navy Yard be again used as a

repair station, and that the shops there be placed in working order. He also recommends the extension of the boiler shops at the Brooklyn Navy Yard, the construction of a new smithery and the renewal of the present railroad track. Built of second hand street rails, the existing track is not capable of sustaining any heavy weights. Consequently, when the boilers of the "Cincinnati" were completed it cost \$3700 to move them from the shop to the ship, a sum for which a substantial track could have been built for the entire distance.

The Fischer Reversing Engine.

The new reversing engine recently introduced by the Fischer Foundry & Machine Company of Pittsburgh, Pa.,

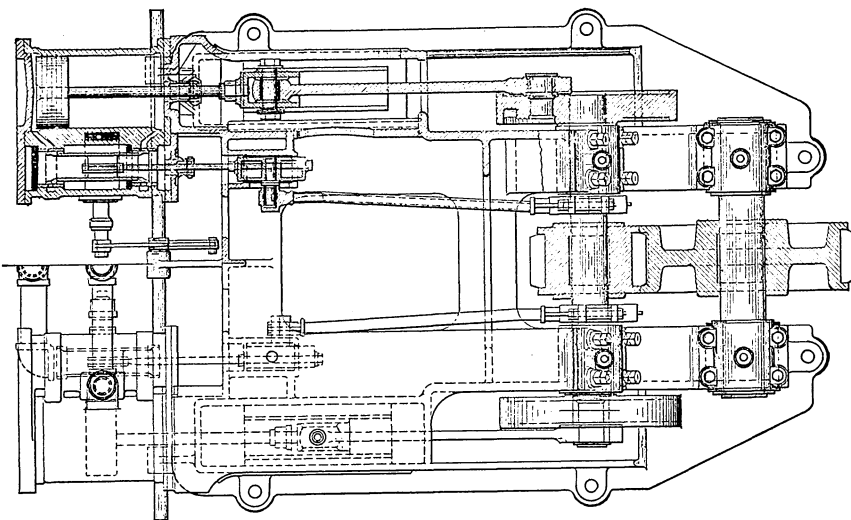


Fig. 1.—Sectional Plan.

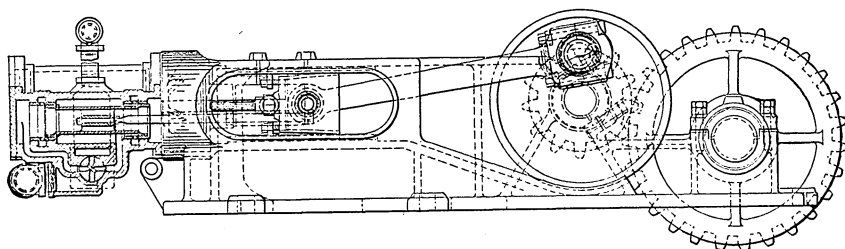


Fig. 2.—Sectional Side Elevation.

THE FISCHER REVERSING ENGINE.

is designed practically for driving mill tables and for work of a similar nature. The main feature is found in the ingenious reversing device. The reversal of the engines is accomplished by causing the slide valve, which is shown in section in both the accompanying engravings, and which in this case is a hollow piston valve, to take steam on the inside of the valve to run in one direction and on the outside of the valve to run in the opposite direction. This is brought about by the use of a double ported "two way" valve and a set of auxiliary ports connecting with the inside of the valve on one side and the outside of the valve on the other side.

In the engraving the position of the reversing valve is such as to connect the steam pipe with the outside of the slide valve, and the exhaust pipe with the inside of the slide valve. Turning the reversing valve through 90 per cent. reverses these conditions and the outside of the valve becomes the exhaust

side, and the inside becomes the steam side and the direction of the engine is reversed. Turning the valve through 45 per cent. shuts off the steam and stops the engine. These engines are built any size from 4 to 12 inches cylinder diameter, either horizontal or vertical, single or double, and for any purpose for which reversing engines are used.

A Welsh Conspiracy.

English papers, led by the *Times*, are fooling themselves with the belief that if any large proportion of the Welsh tin plate workers now in the United States can be induced to return home the American industry will be paralyzed. To accomplish this end a meeting of Welsh tin plate makers was held

recently at the Swansea Exchange, when the matter was discussed and steps were taken to ascertain whether any of the men are inclined to return to Wales. It is thought that the shutting down of most of the American tin plate works pending adjustment of the wage scale, the news of which was, of course, joyfully received across the water, will throw a number of the Welsh tin platers out of employment, and that these men will be glad to return to their native country. The Welsh manufacturers are, in the meantime, warned by the British press to decline, for the present, in their own interests, any further American orders for black plates. It is contended that the American makers, foreseeing a long struggle over the wage question, "are endeavoring to keep their engagements by obtaining from Wales a sufficient supply of black plates, which they can tin by mechanical process and put on the market as American make." The warning does not seem, however, to have been much heeded by the Welshmen, for the *Swansea Daily*

Post, in a recent issue, says that Welsh manufacturers are booking large orders for black plates received from the United States, and a case is mentioned in which the order for 500 tons was accepted by a local maker quite lately. "Such action," the *Post* claims, "if persevered in, must defeat the efforts now being put forth to impose a serious check on the infant industry in the States." The infant industry referred to is already too vigorous a

silver, &c., of which the coating is required. The layer is adherent and the metal can be soldered by the methods ordinarily employed.

The Union Reversible Face Plate Jaws.

As the name indicates, the reversible face plate jaws, made by the Union

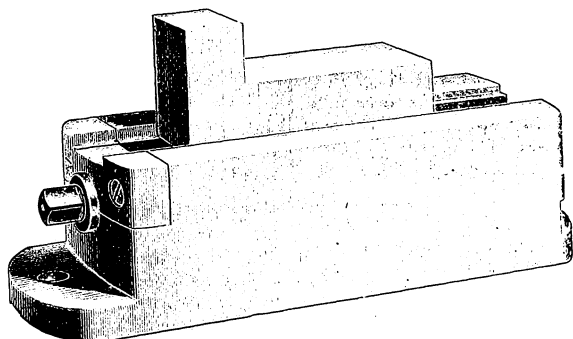


Fig. 1.—Face Plate Jaw, Solid.

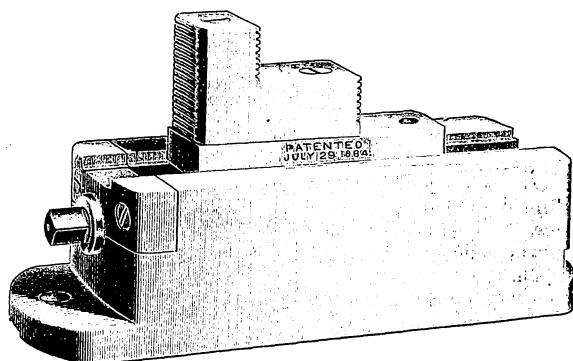


Fig. 2.—Face Plate Jaw in Two Parts.

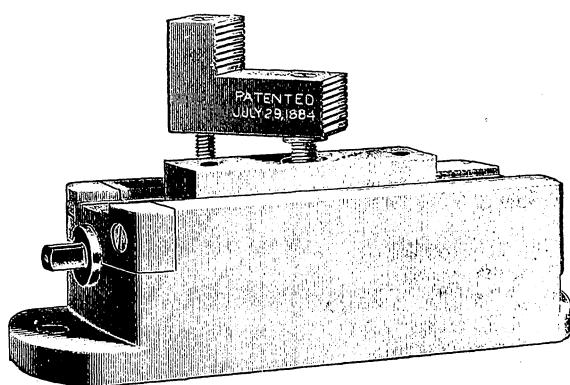


Fig. 3.—Method of Reversing Jaw Shown in Fig. 2.

THE UNION REVERSIBLE FACE PLATE JAWS.

stripling to be strangled by any such methods as those proposed above.

A process for coating aluminum with other metals, the discovery of Herr Neesen, is thus described: The aluminum is cleaned by plunging it in a bath of hydrochloric acid or of caustic soda. It is then immersed in a solution of bichloride of mercury, which decomposes and amalgamates the surface of the aluminum, which is then plunged into the first bath again. After that it is sufficient to put the aluminum in a solution of a salt of the metal, gold

Mfg. Company, are intended to be used on the face plate of lathes and to perform the work that is now done by lathe chucks. By referring to the engravings it will be seen that at each end of the body of the jaw there is a projection formed with a hole through which pass the bolts holding the jaws to the face plate. Sliding in the body is the jaw proper, which is operated by a screw bolt, the square head of which is shown to the left in each cut. To reverse the solid jaw shown in Fig. 1 the screw is turned until the jaw is entirely released, when it is replaced in

the reversed position. The next two engravings show a jaw whose gripping part proper may be reversed without removal from the body. This gripping part is held in position by two screws which permit it being reversed when they are loosened. When shallow work is to be held, this gripping part may be entirely removed and the part sliding in the body employed. These jaws are made in three sizes, 8, 10 and 12 inches, by the Union Mfg. Company of New Haven, Conn., and 103 Chambers street, New York.

The Canadian Sault Ste. Marie Canal.

The Canadian ship canal at the Sault Ste. Marie, the outlet to Lake Superior, is about completed, and it is expected that the first vessel will be locked through on October 24. The work is the pride of Canadians, and well it may be, for it is the last link in a chain of waterways that has cost the debt-burdened Dominion over \$67,000,000, and which will at no distant day allow ocean vessels passage to the northern lakes. While it may be called the last link in this momentous chain, its completion by no means allows such passage at once, for several of the other links are not yet done, though work is being pushed. These are the works in the lower St. Lawrence, where, for reasons best known to itself and the mother country, the Dominion is now replacing a canal on the south side of the river by another a little further away from the United States and on the north side.

This new canal is a prodigious undertaking for a country burdened with an enormous debt and of little internal commerce—only 5 per cent. of the last year's commerce of the Sault was in Canadian vessels—for the work has cost over \$4,000,000. It has, however, been rapidly pushed, and though begun two years after the new United States canal at the same place, is completed a year and a half before the date set for the opening of the other. The work has been done as an imperial, and not as a commercial, necessity. It is to render the Dominion and its transcontinental highway independent of the United States, and the two events that marked, first its beginning, and second, an effort to push it by extra inducements offered its contractors, were the refusal of the United States Government to allow the transportation of Canadian soldiers through the American canal in 1885, and the retaliatory measures adopted by Congress in 1891.

So much has been said of the commerce of the Sault Ste. Marie that it may be unnecessary to say that for the past five years this waterway has exceeded the Suez, and that in 1893, while the Suez passed 3341 vessels, bearing a tonnage of 7,659,000 tons, the American canal, though open only seven months in the year, passed 12,008 vessels and 10,796,000 tons of freight, valued at \$145,500,000. The present American canal is so inadequate to handle the traffic that now vessels are often compelled to wait nearly the whole of the 24 hours to get an opportunity to pass; so that the new canal is needed and at once. In 1890, while digging for a small water power canal on the Canadian side, workmen came on the remains of a canal built away back in 1796, which had been destroyed by United States soldiers in 1812, and had been forgotten ever since. The first large canal was built in 1855 by the State of Michigan and was after-

ward turned over to the general Government. The entire business of the first two years of this canal is now often exceeded in a single day, and the business of the present year to date is more than that of the first ten years of its history.

The new Canadian canal is about 3500 feet long and of a mean width of 152 feet, while it will carry vessels drawing 20 feet of water. It is excavated in solid red sandstone. At its lower end is the lock, 900 feet long, 60 feet wide and with 20.3 feet of water on the miter sills. It is notable that since the first contracts were made in 1888 the ideas of the Government have three times changed and three times have the plans been enlarged to suit the growing commerce of the lakes. The first contract was for a lock 600 feet long, 85 feet wide, narrowing to 60 feet at the entrance, and 16.5 feet deep.

But while the Canadians look with pride on this work as bringing to a magnificent conclusion their long and cherished plans, those who know the facts are despondent that there could be built such a work at such cost and under the supervision of the Government and that it should be so defective and so in need, even before its completion, of costly and immediate repairs. These defects are glaring. One of them is in the walls of the canal above the lock, which are of heavy masonry, but which are bulging out and threaten to give way all along. Portions of these walls have been reconstructed, and in other places they have been braced and patched. It appears that when the change in plans calling for greater depth in the canal was made, the work was hurried by placing under the massive masonry walls timber crib work, which is unable to hold the weight of the stone. It is claimed that the water was let into the canal before it should have been, partly to hide this and other defects and to gain the pressure of the water to help in holding the walls in place. Another defect, and perhaps the most apparent to the casual eye, is the placing of the stone pier of the Canadian Pacific bridge in the middle of the canal, an engineering feat not intended by the original plans, and one that will be remedied at no distant day. There are other minor features of the new work that are not all they should be.

Though the canal is to be used, it is hoped, next week, it will not be formally dedicated till next spring.

The trial of the new United States battleship "Maine," in Long Island Sound, on October 17, was interesting as being the first official trial of a composite built ship, the hull of the vessel having been constructed in the Brooklyn Navy Yard and the engines by the Quintard Iron Works of New York. The trial trip was entirely successful, and was as gratifying to the Navy Department as it was to the machinery contractors, the vessel having been wholly designed by the naval officials on particularly severe specifications. The contract for the machinery called for 9000 collective indicated horse-power, and this, it is calculated, was exceeded by about 300 horse-power at the recent trial, which will insure to the contractors a premium of about \$30,000. Although the trial was for the purpose of determining the horse-power, and not a test of speed, the result in this line was also satisfactory, the vessel maintaining during the four hours an average speed of 15.95 knots per hour, which with a mean allowance for tide

of about $1\frac{1}{2}$ knots would bring the result to nearly 17.25 knots an hour, a very favorable result for a vessel of the weight and build of the "Maine."

THE WEEK.

The coming report of the State Commissioner of Labor, in Ohio, will show that 2394 representative manufacturing industries located in 46 cities paid out in wages in 1892 \$50,838,383.41; same in 1893 paid out \$43,903,857.57, a decrease of \$6,933,516.

A City of Mexico special to the Boston *Herald* reports that the importations of railway iron and steel from Europe into Mexico show considerable increase over the same period of last year.

The French naval estimates for 1895, as submitted by the Minister of Marine, call for an appropriation of \$47,000,000, against the Triple Alliance's joint estimates of \$49,000,000.

Simon Lake of Baltimore claims to have invented a serviceable submarine boat which is capable of being readily submerged to any desired depth and again raised to the surface, and of being propelled either above or below water, as required. The crew, he says, can live comfortably in the boat under water. The inventor is about to build a boat of his pattern at Baltimore, under the auspices of the Lake Wrecking & Submarine Company.

Comptroller of the Currency James Eckels, who a few days ago addressed the Bankers' Club of Chicago, took a very hopeful view of the financial situation throughout the country. He stated that the recent marked revival of business was by no means confined to the great financial centers. The last call for a statement from the national banks, made on October 2, showed an increase in reserve cities since July 18 of \$38,000,000 of loans and discounts. He estimated that, in addition to this, there was an increase of \$20,000,000 in outside cities. It was not confined to the financial centers but seemed to come from every section of the country, indicating a very general and healthy revival. Compared with the statement of one year ago, however, the increase is phenomenal—more than \$150,000,000. All this indicates a restoration of public confidence and more liberal investments.

The Mexican coffee crop is reported to be large and promising.

M. Leroy Beaulieu, the brilliant economic writer and acute observer, writing in a French paper regarding the general industrial outlook throughout the world, advances the opinion that the United States is on the eve of an important forward movement in industrial expansion. He says that with the extraordinary energy and exhaustless ingenuity of Americans, and the enormous capital at command, both in this country and abroad, the chances are greatly in favor of the industrial predominance of the United States in the world's business interests. The industrial and commercial activity which he anticipates will, he thinks, "make it easier for the farmers in the United States to change their system of raising so largely of cereals to a more diversified agriculture." The transition through which the United States is now passing he regards as one of the most important from the standpoint of international economic relations which the century has witnessed.

In his annual report, Commodore George W. Melville, Chief of the Naval Bureau of Steam Engineering, makes the following pregnant statement in regard to the cruisers of the "new navy:" "In the 'Minneapolis,' the 'Columbia,' the 'Olympia' and the 'New York' we have produced," he says, "a quartet of cruisers which in point of speed are unequaled by a like number of ships of any navy in the world. Their trials were more exhaustive and the result such as to leave absolutely no doubt as to the real speed. Subsequent examination of the machinery failed to disclose any weakness or defect of any nature whatever."

The announcement is made of the discovery of a new and rich gold field in the Calico mining district of California.

A Grand Rapids syndicate of furniture manufacturers, who recently opened a warehouse and sample room in Manchester, England, are reported to have already captured some heavy contracts, in competition with English firms, from British wholesale concerns, which will provide a large amount of work in making the goods for the factories at Grand Rapids, Mich., during the approaching winter.

It is stated that H. B. Plant of the Plant system has bought the Florida Southern Railroad, which runs through 250 miles of the richest agricultural and phosphate lands in the State, for \$2,000,000.

Arrivals of steerage passengers from Europe at New York are beginning to show an increase over the figures of the past few months. Last week's arrivals were the highest for a long period. Most of these people are, however, not new immigrants, but have already been in the United States and are returning after visiting their native countries. True immigration into this country is still below the emigration out of it.

The Cotton States and International Exposition, to be held at Atlanta, Ga., has secured a chime of bells, which is said to be the finest ever assembled in this country, and larger than that at the World's Fair in Chicago. They are to be placed in a tower 150 feet high, on the big Manufactures and Liberal Arts Building of the exposition.

Recent heavy rains and floods have destroyed some of the crops in Cuba. Tobacco in the Vuelta Abajo district has particularly suffered.

Press reports state that a combination has been formed by the coal and coke operators of the Kanawha and New River Valleys, W. Va., with the object of reducing selling expenses and fighting the railroads on the question of rates.

The contract for the foundation of the Manufactures and Liberal Arts Building of the Cotton States and International Exposition, Atlanta, Ga., was let last week and contracts for the nine principal buildings are about to be given out.

The Congress of the Argentine Republic is now engaged on the consideration of a bill which aims at a material reduction of customs duties. In some cases the proposed reduction amounts to 25 per cent. on foreign importations, but the average change will be about 15 per cent. Many goods of American manufacture, particularly agricultural implements, lumber and kerosene, will benefit by the proposed new rates.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., October 23, 1894.

Aluminum for Navy Use.

In the office of Chief Constructor of the Navy Hichborn are several sheets of aluminum which had been exposed to sea water for three months and were badly fouled. Commodore Hichborn remarked that it was worse than the fouling of copper exposed for the same length of time, "but this fouling does not condemn its use in various parts of naval construction—for life boats, side fittings, tanks, fittings for air ports, hinges, skylights, doors, bulkheads, &c. It is strong and light and much use can be made of it, but for sheathing it is not a success when exposed to sea water."

The use of aluminum in the construction of torpedo boats in England will be watched with much interest by our naval experts. The lightness and strength of that metal they admit recommend it, but they generally express the opinion that for the hull of any craft, except of such small dimensions as to be carried on large vessels for special service, it is more likely to be a failure than a success. Therefore the item of price is not an essential bar to its use in vessels of dimensions for constant service in the water. Commodore Hichborn has closely watched all experiments in the use of aluminum in naval construction, and thus far concedes the great value of the metal in the finish of ships but not in the construction of hulls.

The Army Rapid Fire Guns.

Gen. Flagler, Chief of Ordnance United States Army, has received a valuable and interesting preliminary report on the test of rapid fire guns, of which the following is a full abstract:

The 6 pounder rapid fire guns tested by the Ordnance Department at the Sandy Hook Proving Grounds were five, viz.: Driggs-Schroeder, Hotchkiss, Maxim-Nordenfeldt, Seabury and Spon-sel.

Each gun was tested in accordance with a programme given briefly in this correspondence some weeks ago, under the following heads:

1. Parts of the breech mechanism.
2. Operation of the gun with maximum outward position of the cartridge when it could be pushed home by the breech block.
3. Firing tests for initial velocity; accuracy at ranges 1000 yards, 1 mile, and 3000 yards.
4. Rapidity with accuracy at ranges 1000 yards and 1 mile.
5. Ten aimed shots in the same line at ranges 500 and 1000 yards alternately.
6. Ten shots alternately at targets at about 500 yards range placed 75 feet apart.
7. Dust test of mechanism and firing.
8. Five excessive increasing charges up to 46,000 pounds or more to the square inch.
9. With defective cartridges in three ways: 1, Firing obliquely through the edge of the rim so as to just show an opening to the interior at the junction of the charge and head; 2, by sawing slots through the head so as just to show an opening to the interior; 3, to cause blowbacks by thinning the material of the primers; 4, dust test, in which after cleaning the parts of the breech mechanism the gun was immersed in a

solution of sal ammoniac and water and suspended vertically, so that the breech mechanism was immersed in the solution.

All of the guns passed the prescribed tests without material injury, except the Spon-sel gun which, by reason of the injury of some parts of the breech mechanism in removal after the rust test, was not fired the five concluding rounds of the test arranged for this time.

The principal results of the test are set forth in the following table. [Much

the fans to the furnaces, so that the air enters the furnaces of the 'Brown's' boilers at a temperature of 270° as against 70° in other furnaces. It is estimated that the 'Brown's' boilers weigh from 70 to 80 tons. As nearly a third more fuel is burned per hour per square foot of grate surface than other boilers burn, it is reasonable to suppose that without this system one-fourth more boiler capacity would be required to furnish the same amount of steam. There is, therefore, 20 tons less boiler weight, and 20 tons more cargo can be carried each trip."

A CIRCULAR from the Miner & Peck Mfg. Company of New Haven, Conn., de-

Exhibit of Tests.

	Driggs-Schroeder.	Hotchkiss.	Maxim Nordenfeldt.	Seabury.	Spon-sel.
Weight of gun, pounds.....	786	792	756	760	792
Caliber, inches.....	2.224	2.224	2.224	2.224	2.224
Length, calibers.....	50	45	42.3	46.1	45
Weight of breech mechanism, pounds.....	35.25	64.75	77.5	30.25	59
Number of parts of breech mechanism.....	15	20	15	30	19
Distance from seat in chamber at which breech block will force cartridge home, inches.....	3	1.5	5.06	7.5	1.25
Number of rounds fired in three minutes.....	83	83	65	35	73
Time to dismantle breech mechanism.....	h. m. s. 0 0 37	h. m. s. 0 0 56.5	h. m. s. 0 0 31.4	h. m. s. 0 8 37.6	h. m. s. 0 0 48.2
Time to assemble breech mechanism.....	0 1 30	0 1 46	0 1 9	0 12 12.4	0 1 44.75
Time to fire one round, change main spring, rear spring firing pin and extractor and fire another round.	0 2 4.8	0 1 37.4	0 3 33.6	0 0 8.51	0 1 12.4
Time to fire 100 rounds.....	0 4 35.6	0 4 26	0 4 41	0 11 34.75	0 4 56.4
Time to fire a defective and one service cartridge.....	0 15 4	not noted; about 15 m.	0 0 50	3 32 0	not noted.
Time to fire five rounds after dusting, first test.....	0 3 20	0 38 39.5	0 3 27.25	0 16 0	0 7 53
Time to fire five rounds after dusting, second test.....	0 0 55.5	0 22 47	0 4 12	.....	0 2 5.25
Time to fire three blowbacks and one service cartridge.....	0 6 58.25	0 1 53.75	0 41 13	2 39 0	0 26 14
Time to open breech block and fire five rounds after rusting.....	1 8 45.5	0 35 0	0 6 25	0 39 0	.....
Total number of rounds fired f.s....	441	370	347	323	364
Maximum excessive pressure, pounds per square inch.....	49,110	64,600	47,490	59,400	53,975
*Accuracy, ten shots, range, 1,760 yards; mean vertical deviation, feet.....	1.3	1.9	2 24	3.72	3.56
Mean horizontal deviation, feet.....	1.82	2 25	1.65	2.92	4.56
Mean deviation, feet.....	2.24	2.95	2.94	4.73	4.38

*In these cases cartridges were fired.

of the ammunition in firing the Seabury gun was reloaded ammunition, which consumed time and made this test relatively more severe than in the case of the other guns].

Trade Publications.

A PAMPHLET by the Detroit Dry Dock Company of Detroit, Mich., gives some of the advantages resulting from the use of the Howden hot draft system as applied to marine boilers. It mentions the steel steamer "Harvey H. Brown," which carries a ton of cargo 1 mile with 8/10 ounce of fuel. Commenting upon this pamphlet states: "This is not responsible for the entire saving, for the boat may have more economical engines than some of those with which she is compared. Neither do the figures show the real economy, for the 'Brown' carries this ton a mile an hour faster than the other steamers carried their ton. There are several sources in the employment of the hot draft system from which economy is derived. First is the perfect combustion of fuel, which is evidenced by the fact that the 'Brown' burns 30 pounds of coal per hour to each square foot of grate surface, while in boilers of other steamers not fitted with the Howden hot draft system only 14 to 20 pounds are burned. By means of this hot draft more and smaller tubes are used, the uptake can be smaller, so that the gases are kept in the boiler longer and more heat is extracted and absorbed by the water, thus increasing the steam generating capacity. An evidence of the saving in this retarding influence is shown by the temperature of the gases in the stack on the 'Brown,' 450° to 500°, while on all other steamers having boilers on which steam is maintained at 150 or 160 pounds the temperature of the uptake is from 600° to 1000°. Even this 500° of heat in the uptake of the 'Brown' is utilized for heating the air that is forced by

scribes their friction drop hammer and blast forges for drop forging. One of the most important features of this hammer is the method employed for moving the roll to grip the board. For this purpose "knuckle joints" are used which have a quick, positive and strong action and permit moving the roll back clear of the board with but a short action of the trip rod. With this machine the board cannot drag on the rolls, as the roll is surely moved back from the board when the hammer is up. The lifter has a large range of adjustment for different thicknesses of board, and by an improved method a perfectly parallel adjustment is secured quickly and accurately. In this lifter there are no bolts or nuts to jar loose. The automatic trip is simple and effective and can be adjusted to any height of die.

THE BONNOT COMPANY of Canton, Ohio, have published a handsomely illustrated catalogue describing their clay machinery. This includes all the appliances necessary for the equipment of brick and pottery plants. This company furnish brick machines, pug mills, dry pans, screens, elevators, represses, carriers, dryer equipments with cars, tracks, &c.

WE HAVE RECEIVED from the Garvin Machine Company of Lait and Canal streets, New York, a circular describing their improved 10 foot bed, 21-inch swing lathe with compound slide rest and power cross feed. The following are the principal dimensions of this lathe: Takes between centers, 6 feet 2 inches; swings over carriage, 13 inches; cone has four drops for 3-inch belt; largest diameter of cone, 11 inches; smallest diameter of cone, 5 inches; front bearing of spindle, 2½ inches diameter, 5 inches long; lead screw is cut five threads to the inch; bed can be furnished from 8 to 24 feet in length; counter shaft has 14-inch pulleys, 4-inch face and is intended to make 115 revolutions per minute; weight 2800 pounds.

The Iron Age

New York, Thursday, October 25, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Reform Needed in the Bar Iron Trade.

Diseased roots make diseased branches. This is as true when applied to business relations as it is in the operations of nature. The Western bar iron trade is a conspicuous example. By reason of the desperate struggle for business among the bar mills a condition of demoralization now exists which is unprecedented. One by one every advantage formerly possessed by manufacturers has been sacrificed. The extra prices charged for rolling the sizes and shapes least frequently called for have been reduced in the attempt to capture orders until there is as little profit in extras as in base sizes. What was once regarded as an efficient bulwark against losses has been pretty thoroughly broken down. Ruthless competition has not only forced base prices to cost or below it, but the range of sizes considered as base has been widened by this struggle, until it is difficult to-day to determine where the line of demarcation shall be drawn. The expression "flat prices," which was only infrequently heard a short time since, has become a common term among quantity buyers. It appears to have originated among those who catered to the car builders, and while the adoption of a flat price to them may have been warranted, because their orders were usually quite large, enabling mills to make good runs on a single size, yet it is now seen that the wedge thus driven into an established and time honored custom of the bar iron trade developed a point of weakness which has been successfully operated upon by other classes of buyers and consumers. This is the case notwithstanding a higher labor cost for rolling sizes not classified as base in mill schedules. Another serious matter is the growing practice of cutting bars to exact lengths before shipment from the mills. It was begun in a limited way to save the waste to consumers, who had been obliged to take random lengths as they were rolled out and cut them up in their own factories, which could not be done without the accumulation of crop ends and short pieces. These were then worthless for any other use and had to be sold as scrap. When the price of bar iron was high this was a considerable item to a buyer or consumer. It was therefore much cheaper to pay a manufacturer a reasonable extra charge for cutting bars in lengths to save waste before shipment from

the mill. As the lengths thus cut ran up to 8 or 10 feet or more, there was a profit to the mill on this work. But what is the practice now? A consumer who works up bars cut to lengths of $6\frac{1}{2}$ or $7\frac{5}{8}$ or $9\frac{1}{8}$ inches, or any other small and very exact size, calls upon the mills to do this work for him and expects to get his bars in this shape as cheaply as though furnished in long lengths, and the chances are that he is able to find some mill willing to do it. Work of this character must be done carefully, consumes much time, must be well paid for by the mill, and should in all justice be done at the expense of the buyer. It saves him the investment in shears and in power to run them, and actually makes the mill an adjunct to his factory. "Chicken feed" orders, as these are called, have latterly become very common.

Not only has the character of mill business been disorganized, but merchants are also suffering. The heavy hardware jobbers, who form an important element in Western trade, are seriously affected by the untoward conditions now ruling. The infection of reckless competition for business has spread to them, perhaps through pernicious though unavoidable contact with mill methods. Their profits have thus been reduced until they are barely receiving cost of handling bars into and out of their stores. With no special pressure from their customers for lower prices, they have, nevertheless, more than followed the decline in mill rates. This is shown by the statement of a very prominent Western jobber, who says that for years the store price was maintained at \$5 per ton above mill charges, but latterly he has been compelled to sell at an advance of but \$1.50 to \$2 per ton, which is largely absorbed by cost of handling in and out, accumulation of slow-selling sizes, rent and store expenses, interest on capital invested, &c. This is chargeable to one or two houses in each jobbing center whose managers have apparently been endeavoring to emulate or imitate the bad example of mill managers. In Chicago alone it is estimated that not less than \$200,000 has been in this way presented to consumers during the past twelvemonth by the jobbing trade. And it has been done without winning any reputation for philanthropy. The reduction voluntarily made to consumers has not been large enough to mitigate the severity of the business depression or to cause a large increase in the sale of the goods made up by manufacturing consumers. The heavy reduction in mill costs, it must be borne in mind, was immediately given to the consumer, and in addition to that the jobber made the further important concession above noted.

It is evident that the Western bar iron trade is in need of important reforms if those now engaged in it hope or expect to continue their connection. Lack of profit means a certain impairment of capital. In the course of time,

and perhaps the time may not be far distant with many, this impairment of capital will surely lead to liquidations or failures. The business is not overdone. Every mill and every merchant fills a place and performs a function which should be maintained. The time will come when the stream of commerce will again run bank full, and the crafts which are now floating in very shallow water will be enabled to sail proudly and fulfill their various missions. But if they would keep floating safely until that time comes they must get rid of some of the burdens with which they have encumbered themselves.

Naming Tin Plates.

At a time in the history of the American tin plate manufacturing industry when new brands of tin and terne plates are increasing and multiplying on all sides, it may be well to call attention to a matter, which, though apparently trivial in itself, is nevertheless of sufficient importance to merit a word of warning and advice. We refer to the vicious practice which has been adopted to a certain extent among the Welsh tin plate workers, of branding plates by symbols or geometrical figures in place of names. It is a most inconvenient way of designating tin plates. Such marks are difficult of description in conversation or correspondence and also to display in print. Plain names of an appropriate nature—and the plainer and more easily decipherable they are the better—are abundant enough to provide a varied nomenclature for all the tin plates that are ever likely to be made in America, without resorting to fancy devices. We trust the American manufacturers may continue to stick exclusively in naming the products of their works to plain, easily pronounceable words. Life is too short and time is too valuable for the ordinary business or tradesman to waste either in the wholly unnecessary endeavor to describe a special brand of tin plate by the fancy mark on it, whereas he can do so in one word in cases where the brand is sensibly and properly named.

The panic of 1893 has so long passed that it is now almost a reminiscence. Its cruel clutch is no more felt on the throat of business men and they occasionally see matters in a different light from that in which at that time they were regarded. In speaking of the distrust and utter lack of confidence then prevailing, a Southern iron manufacturer recently related a circumstance which is not without a humorous tinge. A customer who had not been considered very strong financially sent in an order for considerably more iron than he had been in the habit of buying. It was at the height of the panic, and credits were being very closely scrutinized, even when customers reduced their orders. After some correspondence the manufacturer ad-

vised his customer that the iron would be shipped on account of a local banker with whom an arrangement was made to assume payment. Shortly after the iron had been shipped the banker failed and the account was thus tied up for a considerable time, if indeed it was ever settled, as upon that point our information fails. The real buyer of the iron went through the panic unharmed.

The encouraging fact is noted by numerous iron and steel manufacturers that the pressure for lower prices by large buyers has been in a great measure relieved. For a considerable period manufacturing consumers almost unanimously were of the opinion that it was absolutely necessary for them to reduce prices on their own products to the lowest possible level. In this way they hoped to encourage trade as well as distance their competitors in the matter of costs. The customary refrain to a quotation of prices was: "Can't afford to pay that much; you must get down lower." And manufacturers did get lower, as every one of them felt that he was at the buyer's mercy. No such plea is now being made. Wherever prices are weak manufacturers and not buyers are responsible. There are times in which the prices asked are paid without a quibble, especially if the buyer is seeking the material made by a favorite manufacturer. Only a short time since there were no favorites, but price was the ruling consideration and the cheapest seller took the order.

PERSONAL.

T. W. Welsh, for many years superintendent of the Westinghouse Air Brake Company of Pittsburgh, has resigned his position. Mr. Welsh will continue with the concern in the capacity of consulting director.

A. S. Hay of Naylor, Benson & Co., London, has returned to England.

J. F. Pendleton, who has for several years been connected with the Pittsburgh *American Manufacturer* in an editorial capacity, has removed to Chicago and accepted a position as salesman for Wm. R. Perrin & Co., manufacturers of packers' machinery and Western agents for Boomer & Boschert Press Company of Syracuse, N. Y.

The official computations of the horsepower of the new battleship "Maine" as developed on her recent trial, have been completed. They give 9229 as the horse-power of the propelling engines, air pumps and circulating machinery, insuring to the contractors for the engines, a premium of \$22,900, or \$100 for every horse-power over 9000. The result, although gratifying to the Navy Department, is rather disappointing to the Board of Engineers, as the members of the board who were present at the trial were of the opinion that at least 500 or 600 excess horse-power could have been obtained if the machinery had been handled to the best advantage on the trial, the fire crew and engine room force employed being unfamiliar with the vessel.

OBITUARY.

COL. JAMES H. BURTON.

The death is announced on October 18, at Winchester, Va., of Col. James Henry Burton, who achieved fame during the war by the aid he rendered to the Federal Government at a critical time in the manufacture of rifles for the army. Colonel Burton was born of English parents August 17, 1823, at Spennondale Springs, Jefferson County, Va., and after receiving an education at the West Chester Academy, Pennsylvania, entered a machine shop in Baltimore to learn the business of a practical machinist. In June, 1861, he was commissioned lieutenant-colonel in the Ordnance Department of Virginia by Gov. John Letcher and placed in charge of the State Armory, with instructions to arrange for the removal thereto with the utmost dispatch of the machinery, &c., captured at Harper's Ferry and place it in position for use. Within 90 days from the date of his commission he had the machinery at work in Richmond producing rifles of the United States pattern.

HENRY D. M'EWAN.

Chief Engineer Henry D. McEwan, United States Navy, died in Washington, D. C., on Thursday, October 18. Mr. McEwan was born in 1839 and entered the navy as engineer at the beginning of the Civil War in 1861. He was engineer in charge of the monitor "Canonicus," which made an eventful voyage from Philadelphia to Key West, Fla. He served two years on the United States steamer "Michigan," cruising on the lakes, and was attached at different times to the New York, Philadelphia and Norfolk navy yards. His last sea service was as chief engineer of the "Boston," attached to the White Squadron. Then he was assigned to duty on the Examining Board in Philadelphia, and was retired on account of disability.

A. L. INMAN.

A. L. Inman, general manager of the Crown Point Iron Company and of the Chateaugay Ore & Iron Company, died suddenly from heart disease at Plattsburg, N. Y., on October 18. Mr. Inman, who was 55 years old, was formerly superintendent of the Champlain Transportation Company, and held many offices of honor and trust in Plattsburg and Clinton County, N. Y.

SAMUEL WINSLOW.

Samuel Winslow, founder of the Winslow Skate Mfg. Company, Worcester, Mass., and ex-mayor of that city, died at his home on Sunday the 21st inst. Mr. Winslow had been suffering from a complication of diseases for nearly a year, and for the past six months had been confined to his house. Mr. Winslow was born in Newton, February 28, 1827, and was a descendant of Kevelin Winslow, brother of Governor Edward Winslow of the Massachusetts colony. Mr. Winslow received his early education in the schools of his native town. After leaving school he was employed in the manufacture of cotton machinery, in which he displayed great industry and inventive skill. So rapidly did he advance that at the age of 20 he became foreman in the shop with over 50 men under his charge. He removed to Worcester in 1855, and April 1 of that year formed a partnership with his brother, Seth C. Winslow, and started

a machine shop. In 1857 they began the manufacture of skates, in which they were especially successful, peculiarly, in connection with other branches of manufacture. At the death of his brother in 1871, Mr. Winslow assumed the entire control of the business and continued it alone until the formation of the Samuel Winslow Skate Mfg. Company in May, 1886, in which Mr. Winslow retained a majority of the stock, and serving the corporation as its president and treasurer.

Up to 1872 the business had consisted entirely of the manufacture of ice skates. In that year J. L. Plympton, who first brought out the roller skate, but who never made a great success of his invention, employed Mr. Winslow to make roller skates for him. Some of these skates were exported to Europe and India, and the business increased rapidly. In 1880 Mr. Winslow invented the Vineyard roller skate, which became immensely popular. Mr. Winslow energetically pushed the sale of his invention and accumulated a large fortune from the sale of his roller skates. Ice skates are now, however, the principal manufacture of the company.

Mr. Winslow, while a prominent manufacturer, was also conspicuous in politics. He was elected mayor of Worcester for four successive terms, was a member of the Common Council of the city in 1865 and 1866, a representative from Worcester in the general court in 1873 and 1874 and alderman of the city in 1885. Mr. Winslow was also connected with the Citizens' National Bank and the People's Savings Bank of Worcester. He had also for the past three years been prominently identified with suburban street railways. He was regarded as one of the most enterprising, useful and public spirited citizens of Worcester.

FRANK W. HAY.

Frank W. Hay of the Hardware firm of F. W. Hay & Sons, Johnstown, Pa., died on the 8th inst. Mr. Hay was born in York, Pa., in 1823, and had been connected with the tin and hardware business for about 50 years. The establishment was destroyed in the great flood of 1889, but business was resumed in another location. Mr. Hay was for three years identified with the publication of the *Johnstown News and Valley Wreath*, now the *Tribune*.

LOVEAD T. DEAN.

Lovead T. Dean, for many years vice-president of the Belfont Iron Works, Ironton, Ohio, is dead, at the age of 74 years.

The ill-fated new Louisville and Jeffersonville bridge across the Ohio River was the scene of another accident on the 17th inst. Three men were hurt, one perhaps fatally. The accident was caused by the falling of a part of the false work under the fourth span, which had just been completed and locked. The men were engaged in removing the false work which is to be transferred to the fifth and last span. They were at work on the first bent or division of the structure. The top timbers had nearly all been removed when the remainder of the section collapsed.

The Illinois Central Railroad recently let the contract for 19 new locomotives and is now said to be in the market for 500 freight cars.

The Effect of Stress on the Corrosion of Metals.

Thomas Andrews has contributed a series of papers on the different aspects of corrosion of metals to different English technical societies. The latest of these was brought before the British Institution of Civil Engineers. The original is accompanied by an elaborate record of tests. Mr. Andrews summarizes his work in the following manner:

The author arrived at the following conclusions as a result of his other recent investigations on the corrosion of metals—namely, that wrought iron and various steels, when exposed singly and separately, without liability to galvanic action other than local, to the action of sea water for long periods, showed a greater corrosion on the part of all the steels than the wrought iron, the advantage in favor of the wrought iron as compared with the steels amounting roughly to 25 per cent. and upward. It was also noticed that corrosion was increased in the steels in proportion as the percentage of combined carbon was greater.

Further, it has been found that the galvanic action between wrought iron and steels induced a largely increased total corrosion in the several metals. The author has also recently observed another aspect of the corrosion of metals liable to occur in tidal streams, or under circumstances where the different parts of metallic structures, vessels, &c., may be exposed to the action of waters of dissimilar salinity. In tidal streams this state is brought about by the gradual rise and inward flow of salt water, and the outward flow of fresh water. Hence, the upper and the lower portions of a metal structure, or vessel, although composed throughout of the same metal, are exposed to electrolytic disintegration from the galvanic action set up by solutions of different salinity on the metal. Moreover, it has been shown by the author that there are indications that magnetic influence tends to increase the corrosion of steel.

The experiments now recorded have afforded the additional information that the corrosion of metals is considerably affected by stress, varying according to the nature and extent of the strain applied. It might have been thought that metals under stress would be more liable to increased corrosion than when in their normal state. The present experiments, however, indicate the opposite conclusion. This is when "strained" is considered separately from "unstrained" metal. When, however, the strained metal is in galvanic circuit or combination with the unstrained metal in any solution, an increased total corrosion ensues from the galvanic action which this research has shown to arise consequent on the difference of potential between the two. The reason why the mere fact of a metal having become strained reduces its corrobility, compared with the same metal in its normal unstrained condition, will be found in the results of a series of experiments undertaken by the author to investigate the influence of stress on railway axles. In that research it was demonstrated that stress, whether tensile, flexional, torsional or of any other kind, considerably alters the physical properties of iron and steel. Stress increases the rigidity of both iron and steel and renders the metal harder, also greatly reducing its properties of elongation or ductility. A higher tonnage is required

to break a strained than an unstrained portion of the same metal. A tensile stress applied to a wrought iron shaft, producing an elongation of only 2 per cent., increased the tensile resistance of the metal 2.66 per cent. Other investigators have also noticed a similar alteration in the properties of metals referable to stress.

From these observations it is manifest that the stresses applied to the metals examined for corrosion altered their structure, rendered them harder in nature, and hence less liable in the strained condition to be acted upon by sea water, or other waters, than in their ordinary normal or softer condition. The experiments, however, indicate that an increased total corrosion in excess of the normal corrobility of the metal occurs in a metallic bridge, vessel, boiler or other structure from the action of the local galvanic currents which are hereby shown to be induced between "strained" and "unstrained" portions of even the same piece of iron or steel forging, bar or plate. Hence a strain occurring in a metallic structure tends, owing to the local galvanic action thus set up, to increase any corrosive forces which may be deteriorating the metal of which it is composed.

A Boston banker, says the *Engineering News*, recently received a letter from a Kansas institution soliciting bids for certain Kansas county bonds. In reply, the Boston banker stated that he could not find customers for county bonds in those States which espoused silver or populists' ideas. "If the bonds were offered on the basis of pig silver," wrote the banker, "a customer might be found, but on a gold basis there was no market for them in the East." And most Eastern bond dealers will bear out the Boston banker's objection to Western bonds.

The production of Spelter in Silesia for the first six months of 1894 amounted to 45,824 tons, as against 44,788 tons for the same period in 1893. The deliveries during the first six months of 1894 amounted to 44,305 tons, as against 44,898 tons during the same period in 1893.

A wail comes from Hamilton, Ohio, because that usually bustling little city is not recovering from the lethargy into which its manufacturing interests fell at the beginning of hard times. Business is referred to as being stagnant, while the number of unemployed is very large, with no prospect of work during the coming winter.

The Lick Manual Training School, established and endowed by the founder of the great Lick Observatory, has been opened for work in San Francisco.

The British Board of Trade returns for September show a falling off in the values of both exports and imports as compared with the corresponding month of last year, although the figures at that time were reduced by the great coal strike. The imports are valued at \$145,200,000, a falling off of \$5,424,000, equal to 3 per cent.; and the exports of British and Irish goods at \$84,480,000, a decrease of \$4,008,000. The largest decreases in imports are in food stuffs, oils and metals. In exports the greatest falling off is shown in textile fabrics, machinery and wearing apparel.

MANUFACTURING.

Iron and Steel.

Mackintosh, Hemphill & Co., Pittsburgh, Pa., have decided to engage in the manufacture of tin andterne plate on an extensive scale. As yet the plans for the new venture have not all been worked out but will be in a short time. The concern will not erect a bar mill but will buy their sheet bars in the open market. It is proposed by them to erect a model plant in every respect. The engines for driving the mills will be especially heavy and driving will be done direct. In this connection we desire to state that the report that this firm would abandon the manufacture of steel castings is without foundation. The firm will continue in this line as heretofore and have never contemplated giving it up.

Regarding the statement that a number of departments of the plant of the Pennsylvania Bolt & Nut Company, Lebanon, Pa., had been closed down for an indefinite period on account of lack of orders, we are advised that it has been greatly exaggerated. The facts are that the 16-inch mill and the puddle mill were closed down for one week, but these departments are again in full operation.

The Union Iron & Steel Company, Youngstown, Ohio, are making some extensive additions to their equipment, and have recently let a contract for the erection of a continuous mill.

Soho Furnace of the Moorhead-McCleane Company of Pittsburgh is being cleaned out and necessary repairs made, in order that the furnace may be in the best possible condition should resumption of operations be warranted in the near future.

The Apollo Iron & Steel Company of Pittsburgh, with works at Apollo, Pa., and manufacturers of galvanized iron and steel sheets and tin andterne plate, deny the report that they contemplate the erection of a number of additional tin plate mills.

John D. Briggs, president of the Findlay Rolling Mill Company, Findlay, Ohio, last week purchased for \$22,600 the plant of the Muncie Rolling Mill, Muncie, Ind., which has been operated under lease for some time by the Muncie Muck Bar Company. The plant was built in 1888-9, while part of the machinery was removed from Greencastle, Ind. It was put in operation in March, 1889, and contains 18 double puddling furnaces, two scrap furnaces and two 18-inch trains of rolls, the product being muck bar exclusively and the annual capacity 25,000 gross tons. The plant also embraced a cut nail factory, containing 50 nail machines, but these were destroyed by fire on August 26, 1892. Until other arrangements are made, the muck bar produced at this plant will probably be shipped to Findlay, Ohio, and worked into finished material by the Findlay Rolling Mill Company.

Corrigan, McKinney & Co., Cleveland, Ohio, have just completed a lease of the Sharpville Furnace, at Sharpville, Pa. The necessary repairs to the plant will be made as early as possible, and the furnace will be put in operation as soon as these have been completed. The furnace will be under the management of C. C. Jones, who is also superintendent of Douglass Furnace, at Sharpville, Pa., also operated under lease by Corrigan, McKinney & Co.

Hamilton Furnace of Means, Kyle & Co., Hanging Rock, Ohio, resumed operations on Tuesday, the 16th inst.

Lime Rock Furnace, in Litchfield County, Conn., has started up after an idleness of nearly three years.

The East Canaan Furnace of the Barnum Richardson Company, at East Canaan, Conn., which has been idle for a long time, will probably be blown in soon. New boilers are now being erected at the plant.

The new car wheel works which have been building at Raleigh, N. C., for several months, have been completed and put in operation. The works have a capacity of 50 wheels a day. The company have a capital stock of \$100,000, and the Lobdell Car Wheel Company of Wilmington, Del., are said to be largely interested in them.

It is understood that an effort is being made to reorganize the Kellogg Seamless Tube Company, with the object of operating the plant at Findlay, Ohio. The project includes buying up the indebtedness of the old company at fifty cents on the dollar,

and the formation of a new company, to be known as the Kellogg Weldless Tube Company. It is stated that a majority of the creditors have assigned their claims to the International Trust Company of Boston, under an agreement with John C. Polley of Boston, who is carrying through the work of reorganization.

The new plant of the Tasker Pipe Company, at Bethlehem, Pa., is nearly completed. The project is backed by a number of local capitalists, who joined with Stephen P. M. Tasker of Philadelphia to erect a plant for the rolling of steel pipe under patents held by Mr. Tasker. Last February the company began the erection of a frame building 70 x 120 feet, and the contracts for the machinery were let to the Bethlehem Foundry & Machine Company and to Geo. V. Cresson of Philadelphia. The pipe turned out by the company will be used for stacks, water pipes, &c.

A part of the iron works of the Tredegar Company, at Richmond, Va., has been destroyed by fire. The fire originated in the car shops, and spread to the horseshoe, blacksmith, pattern and other shops, all of which were consumed. The loss is about \$150,000, fully covered by insurance.

It is stated that the Kilmer Mfg. Company of Newburg, N. Y., have leased a factory at Joliet, Ill., and will occupy it as a plant for the manufacture of baleties and galvanized iron.

Keystone Furnace of the Reading Iron Company, Reading, Pa., has blown out for repairs, after two years' continuous operation. The two Reading furnaces, which have been idle for a long time, are said to be in good working condition, and are likely to be blown in at an early date.

The Reading Iron Company of Reading, Pa., have decided to erect a rolling mill for the rolling of skelp iron. The plans and designs have not yet been matured, but a tract of ground adjoining the Keystone Furnaces has been secured. All the machinery for the new mill will be constructed by the company in their "Scott Foundry" department.

The Muncie Iron & Steel Company of Muncie, Ind., turned out their first hoops on the 10th inst. It is the intention to convert a considerable part of the mill product into hoops.

The property of the Virginia Nail & Iron Works, at Reusens, in Campbell County, Va., consisting of a rolling mill and the Nannie B. blast furnace, has been sold at receiver's sale. The purchaser was David Leamar, who represented his own interests and those of certain of the first mortgage bondholders. The price was \$35,000.

The receivers of the Pottsville Iron & Steel Company, Pottsville, Pa., Atkins and Briscoe, through their attorney, George M. Roads, have filed the statement of the assets and liabilities of the Pottsville Iron & Steel Company, as shown in books of the company on August 24 last, the date the assignment was made. The assets, in exact figures, amount to \$1,197,730.36. From this amount will be set off \$45,972.66 for doubtful accounts. Much of the latter sum may never be collected, and such is the opinion of the receivers, and therefore the fact is entered in this statement. The liabilities of the company from every source, bonded and floating, &c., amount to \$645,802.84.

Thomas Furnace of the Thomas Furnace Company, at Niles, Ohio, has been making an excellent record in production lately. In 24 hours recently 250 tons 600 pounds of standard Bessemer iron was turned out by this furnace.

A notice has been posted at the American Sheet Iron Works, Phillipsburg, N. J., announcing a reduction of 10 per cent. in wages of all employees. This is said to be the second reduction within a year.

Machinery.

The shops of the Kansas City Car & Foundry Company, at Kansas City, Mo., are fast nearing completion. They cover 14 acres of ground and consist of a blacksmith and machine shop, 50 x 112 feet; an erecting shop, 250 x 175 feet; a wood mill, 75 x 112 feet; an engine room, 32 x 60 feet, and a fire kiln to dry the lumber in. Everything is expected to be in working order by November 1. The company expect to employ about 500 men when the works are in operation.

The new J. R. Thomas Machinery Company have decided upon the plans for their plant at Green Bay, Wis., where they pro-

pose to turn out wood working machinery. All the buildings except the office and pattern shop will be of brick, these two being frame structures. Foundations are of stone throughout. The different buildings are: Foundry, 50 x 140 feet; machine shop, 60 x 150; pattern shop, 30 x 75; office, 16 x 26; boiler and engine house, 25 x 42; blacksmith shop and cleaning room, 22 x 42.

The Pierpoint Boiler Company of Pittsburgh, manufacturers of Pierpoint water tube boilers, have received a contract for 500 horse-power of this type of boiler from the Philadelphia Natural Gas Company, at Murraysville, Pa.; also a battery of boilers for the Laurel Grove plantation, at La Fourche, La.

The Pittsburgh office of the Babcock & Wilcox Company have received an order for 1500 horse-power of this type, to be placed in the Duquesne Steel Works, Duquesne, Pa. An order has also been received from the Carrie Furnace Company of Rankin, Pa., for 2500 horse-power.

The Hendrick Mfg. Company, Limited, of Carbondale, Pa., manufacturers of ice making and refrigerating machinery, hydraulic and filter presses, perforated sheet metals and screens, have recently enlarged their facilities by adding a 9½ x 16 x 12 inch compound condensing engine with belted air pump, supplied by B. W. Payne & Sons of Elmira, N. Y.; a Newton No. 1 cold saw cutting off machine; a 20-inch Prentice drill; a Woodward & Rogers 12-inch sensitive drill; a Hilles & Jones No. 60 combined punch and shear; a Hendey milling machine and a number of special tools of their own design. The company are busy in all their departments and have had a prosperous year; 150 men are at present employed. Other improvements are contemplated for the near future to meet the demands of a growing business.

Reeves Brothers, Alliance, Ohio, manufacturers of boilers and rolling mill machinery of all kinds, are erecting an addition to their plant 100 feet square, which makes their main building 100 feet wide and 250 feet long, under one roof, constructed of brick. It was necessary for the firm to build this addition, inasmuch as their trade during the past season has been considerably beyond the present capacity of their shops, and they have necessarily been having a large number of men working in the open air all summer.

The Cincinnati Milling Machine Company, Cincinnati, Ohio, has just shipped one of their large size milling machines and three grinding machines to Germany. They say that the increase in their foreign trade has been quite satisfactory and has kept them running during the dull season of the last 15 months.

The R. E. Parsons Company, Bridgeport, Conn., for a number of years well known as founders in gray iron, have added a department for the manufacture of brass, copper and composition castings.

The National Machinery Company, Tiffin, Ohio, state that the pressure of orders for their improved lines of machinery is so great that they are obliged to run extra time every night to meet present demands. They have improved their machinery greatly within the past 12 months.

The firm of William Taylor & Sons, proprietors of the Columbian Iron Works, at Adams and Water streets, Brooklyn, N. Y., have made an assignment to Col. Alexander S. Bacon, without preference. The business was established 50 years ago by William Taylor, who died in June, 1889, and his sons, James A., William J. and Edwin D., have been partners in the concern for over 30 years. They at one time made a specialty of sugar machinery, but of late years have devoted their attention to the manufacture of ice and refrigerating machines.

The reorganization of the Diamond Drill Company of Birdsboro, Pa., the property of which was recently sold by the sheriff, has been completed, and the concern are to be incorporated under the title of the Diamond Drill & Machine Company. The incorporators are George Brooke, Edward Brooke, Robert E. Brooke, William H. Rhawn and Philip S. Zieber. The works have already resumed operations.

The Texarkana Car & Foundry Company of Texarkana, Ark., have made an assignment for the benefit of creditors. The assets are estimated at \$30,000; liabilities not known. Hard times and failure to make collections are given as the causes for the failure.

Stewart & Munnigal's foundry and machine shop, at Webb City, Mo., have been

burned, entailing a loss of \$8000. This is the third time these works have been burned since they began operations.

Wm. H. Wood, Media, Pa., is calling the attention of manufacturers to his line of steam hammers and hydraulic machinery. Mr. Wood has achieved quite a reputation as a designer and builder of hydraulic machinery, his products being in demand throughout the country.

The Pennsylvania Machine Company, Limited, 31 North Seventh street, Philadelphia, have just completed the installment of a pumping plant at the League Island Navy Yard, Philadelphia, using therein one of the late Capt. John Ericsson's caloric pumping engines.

The Penn Elevator Engineering Company, Bloomsburg, Pa., have signed a contract to build two hydraulic elevators for the Jayne estate, 625 and 627 Chestnut street, Philadelphia, Pa.

Chandler & Farquhar, dealers in machinists' supplies and hardware, and agents for Lodge, Davis & Co.'s lathes and tools, have removed from 177 and 179 Washington street, Boston, to 36 Federal street, running through to 133 Congress street, where they will occupy a store and basement 40 x 85 feet. Their machinery department, formerly at 23 and 25 Purchase street, will be consolidated at the new location.

The Glamorgan Pipe & Foundry Company of Lynchburg, Va., have resumed operations. A fire at the works made it necessary to suspend operations some six months since, until the burnt structures could be replaced.

The Exeter Machine Works of Pitts- ton, Pa., have just completed a conveying plant for A. S. Vanwinkle & Co. of Beaver Meadow, Pa., and are now placing several coal jigs for Jermyn & Co. They are also putting in a large elevating and conveying plant for Pardee Bros. & Co.

The Lenoir City (Tenn.) Foundry Company are about to begin operations. These works, which have a capacity of 200 car wheels and 50 tons of castings per day, are a branch of the Bass Foundry & Machine Works of Fort Wayne, Ind.

The Birmingham Iron Foundry, in the borough of Birmingham, Conn., is one of the oldest foundries in the State of Connecticut, having been established in 1836. The company for some years past, on account of the increasing demand for their output (their specialty being chilled rolls), have been operating a foundry also at Derby, Conn., just across the river. This year the company decided to rearrange and enlarge their buildings at Birmingham, and now have these about completed. The new foundry forms an L to the old structure and is 75 x 200 feet, the walls of brick and stone with iron trussed roof. During these alterations the company are putting in a new 67-inch Colliau cupola furnace, manufactured by Byram & Co., Detroit, and will also continue to use a smaller Colliau which has been in use some years with satisfactory results.

Hardware.

M. M. Pillsbury's axe factory, at Nanpanoch, N. Y., was destroyed by fire on the 14th inst. Loss, \$25,000; no insurance.

The Brett Mfg. Company, New Haven, Conn., have been organized for the manufacture of beef slicing machines and other hardware specialties. The capital stock is \$2000.

The Excelsior Cutlery Company, Worcester, Mass., have increased their capital stock from \$5000 to \$10,000, and the premises at 95 Foster street have been enlarged. A new business office and a third workroom have been fitted up. The additional stock has nearly all been subscribed for by the original stockholders.

The Reliance Edge Tool Company, Indianapolis, Ind., have removed to North Indianapolis, where they have erected a new plant.

The Chapman Tin Mfg. Company have removed from Clifton Springs, N. Y., to Newark, N. Y.

The American Ball Nozzle Company of New York City have been incorporated, with a capital of \$200,000. They will manufacture nozzles for all kinds of hose, pipes, &c. The directors are Frank M. Clute, Henry Herrold, William H. MacNabb, Benjamin F. Merritt and Richard H. Jaeger.

Cleveland Machine Screw Company, Cleveland, Ohio, are engaged in erecting a new shop with greater capacity than the original works, and also a fine office building.

William Deering & Co., Chicago, Ill., will hereafter manufacture their own twine in a plant now under construction.

The Billings & Spencer Company have recently received a machine made for them by the Dwight Slate Machine Company, which will greatly facilitate the manufacture of their bicycle wrenches.

The O. K. Steam Washer Company, Oakville, Ill., have surrendered their charter.

The Geo. M. Shirk Refrigerator Company, 114 Lake street, Chicago, were burned out on the 15th inst., suffering considerable loss in stock. Temporary quarters have been established at 110 Lake street.

The formation of a company at Elkhart, Ind., to manufacture bicycles is announced. The officers are as follows: H. E. Bucklin, president; P. Hill, vice-president; D. N. Weaver, secretary; W. L. Collins, treasurer; Mr. Halliday, superintendent. The capital stock is \$35,000 and the business of the company will be conducted in a portion of the Clause factory. The work of preparing machinery and securing the tools necessary will begin at once. The company will manufacture a commercial wheel, and already have orders for 300, with another order of 500 in sight. They expect to manufacture 1000 wheels during the coming year, and will at once arrange the working force to that end.

The King Powder Company, Cincinnati, Ohio, have filed articles applying for enlargement of capital stock.

The Lamb Mfg. Company, Chicopee, Mass., manufacturers of bicycles, skates, gymnasium goods, &c., have a four-story addition to their factory nearly completed and will occupy the building about December 1. The second floor of the building will be used as a receiving room for supplies and for bicycle repairing. The third floor will be used only for the assembling of skates and bicycles, and the fourth floor will be given up to the storage of bicycles and gymnasium goods.

William Roper, manufacturer of athletic goods, Highlandville, Mass., is building an addition to his factory, to be used as a drying room. He is also enlarging his electric light plant and putting in a new dynamo.

The American Needle & Fish Hook Company of New Haven, Conn., have become the American Fish Hook Company. The company have not made any needles for several years and applied to the courts for permission to change the name, which was granted.

The C. S. Brooks Arms Company of Portland, Maine, are considering the advisability of locating their factory at Scranton, Pa., and are negotiating with parties in the latter city with that end in view.

Sager Mfg. Company, Rochester, N. Y., have recently been incorporated, with a capital stock of \$25,000. The company will manufacture bicycle saddles and other bicycle attachments.

The Indiana Bicycle Company, Indianapolis, Ind., will establish a branch house at Atlanta, Ga. Edward Rolle, formerly in charge of the bicycle department of the Lowry Hardware Company, will be manager.

The Century Bicycle Mfg. Company, Indianapolis, Ind., will move to Shelbyville, Ind., and will commence operations as soon as the machinery can be placed in position. Employment will be given to 100 men.

Butterfield & Co., Derby Line, Vt., advise us that in the month of August their trade was larger than in the corresponding month of any year save one, since 1878. While September was not correspondingly large, it was more than 20 per cent. larger than in 1893. Business during the present month promises to be equally gratifying. The firm are running full time, and are turning out all the goods possible.

Joseph Dixon Crucible Company, Jersey City, N. J., and 68 Readstreet, New York, advise they were never so busy in crucibles for brass and steel melters as now. When the mills began to start up, not having a large stock on hand, they soon found themselves embarrassed to execute their orders, as every one wanted his goods at once. This has necessitated their running day and night. Their trade in lead pencils and graphite paints is also referred to as particularly good, the demand for this kind of paint for roofs and metals continually increasing. The paint is put up in cans of 10, 25, 50 and 100 pounds, ground in oil, and in barrels of 450 pounds. Thinned and ready mixed it can be had in lots of 5, 10, 25 and 50 gallons.

Bloomsburg Mfg. Company, Bloomsburg, Pa., who commenced to manufacture on August 1, report having business in hand which will require two months to execute.

The Hartman Mfg. Company, Ellwood City, Pa., have recently broken ground for a 100 x 150 foot addition to their mat factory. Their business in this line they allude to as having very largely increased.

Miscellaneous.

The Turnbull & Cullerton Roofing & Metal Lath Company of Chicago made an assignment in favor of Howard Wagner as assignee on the 17th inst. Assets, \$51,700; liabilities, \$22,500. The corporation have been in existence for a year, but the firm who preceded them, Turnbull & Cullerton, were in business for a number of years and were generally supposed to be one of the solid concerns in the business. The officers of the company are E. F. Cullerton, president, and George A. Turnbull, treasurer and secretary. The failure is attributed by the concern's attorney to an inability to make collections and the unprepared maturity of a lot of commercial paper. The creditors are few in number, and the officers of the company say they are confident a satisfactory settlement can be made with all the creditors in a short time.

The Walburn & Swenson Mfg. Company of Chicago have received an order from J. J. Hagerman of Colorado to equip a large factory in the Pecos Valley for the purpose of extracting liquid from the canaigre root, which is very rich in tannin. The cultivation of this root on a large scale is now in progress, and it is expected to revolutionize the tanning business. Professor Swenson of the Walburn & Swenson Company has devoted most of his time during the last three years to experimenting with canaigre root, and has succeeded in manufacturing a special line of machinery whereby they are enabled to extract the liquid at a nominal cost.

The glass works of the McKee Brothers Company, Jeannette, Pa., is to be equipped with producer gas. A contract has been given to the S. R. Smythe Company, Lewis Block, Pittsburgh, Pa., for the gas producer plant, about 2000 feet of gas connections, recuperative attachments and applications to 30 lehrs and 24 glory holes. The S. R. Smythe Company also have the contract to furnish the Jeannette Bottle Works with a regenerative semi-continuous glass tank, working 16 shops making bottles, chimneys and flint glass, including gas producer plant and attachments.

Wilkins & Davison of Pittsburgh have the contract for the erection of a 100-oven coke plant for the Randolph Coal & Coke Company of Randolph County, Ill. They are also erecting 300 additional ovens for the Oliver Coke & Furnace Company, at Red Stoe Junction, Pa., and 100 ovens at the Eliza Furnace of Laughlins & Co., at Pittsburgh, Pa.

The D. R. Lean Company, engineers and contractors, Penn Building, Pittsburgh, have the contract for the brick work, also setting the boilers, for the new gas pumping station now being erected by the Philadelphia Company, at Canonsburg, Pa. The boiler house will be 70 x 40 feet in size, and the engine house 60 x 70 feet.

The Pittsburgh Trolley Pole Company of Allegheny, Pa., have been granted a charter of incorporation with a capital stock of \$5000. R. S. Robb, Geo. R. Proctor and John D. Bigger of Pittsburgh are directors of the concern.

Press dispatches dated Duluth, Minn., October 19, state that A. J. Trimble has begun an action for a receiver for the Pittsburgh Iron Company. It is alleged that the company are indebted to him for \$50,000 for iron land and that the assets consist of only \$3000 equity on the land in question.

The Shickshinny, Pa., Tube Company are now in full operation in their building recently erected. Their specialty is the manufacture of seamless brass, copper and bronze tubing. The manufacturing department consists of a shop 135 x 75 feet, with a wing 75 x 75 feet. Boiler house is 35 x 35 feet. The plant was built by Richard & Richardson, Bloomsburg, Pa.

The Baltimore & Ohio Railroad Company contemplate the erection of large machine and repair shops at Baltimore, Md.

Wm. B. Pollock & Co., proprietors of the Mahoning Boiler Works, Youngstown, Ohio, have established an office in New York City in charge of Chas. McClure, as manager and Eastern agent.

H. E. Collins & Co., Pittsburgh, Pa., have sold 2000 horse-power Cahall water tube boilers to the Carnegie Steel Company, Limited, for use in the pumping station now being erected by the Carnegie Natural Gas Company, at Bagdad, Pa.

Experiments with Superheated Steam.

In March and April, 1893, a series of experiments on the relative consumption of steam and fuel with saturated and superheated steam was carried out by the Alsace Union of Boiler Owners. The experiments extended over a period of six weeks. The boiler installation consisted of five cylindrical boilers, each with three heating tubes; each boiler had 640 square feet of heating surface, and 27.8 square feet of grate. The firing was from below, and the boilers were designed for a pressure of 12 atmospheres. On the last boiler was fitted a Green's economizer heated by the waste gases from the five boilers and from an Uhler's superheater. The steam engine was horizontal, triple expansion, with Frikart valve gear, the high pressure and intermediate cylinders on one side, the low pressure cylinder and condenser on the other side, behind each other. The diameters of the cylinders were 18.8 inches, 28 inches and 48 inches respectively; the stroke was 56 inches, and the number of revolutions per minute 70. The principal results are exhibited in two tables and the deductions made are:

1. Theoretically, it has never been denied that superheated steam should give a higher efficiency than saturated, yet from fear lest the cylinder should be damaged by the high temperature, for years no experiments were made with superheated steam. Now, however, after numerous experiments, the oldest engine can safely be used with superheated steam without injury, the economy being greater than with saturated.

2. In installing a superheater care must be taken that the advantages gained are not lost either by less perfect combustion or by greater radiation losses; the cost of the superheater must, of course, not exceed the saving obtained in coal consumption. The superheater should be connected with the boiler so that both can be fired from the same furnace. After leaving the superheater the gases should come in contact with the heating surface of the boiler, and, lastly, with the heating surface of the economizer.

3. The use of superheated steam does not exclude the use of steam jacket. Though both superheating and steam jackets were used, yet condensation in the high pressure cylinder occurred.

4. The two different kinds of coal used gave different results.

5. The use of low pressure, $7\frac{1}{2}$ atmospheres, did not give such good results as the use of high pressure, $11\frac{1}{2}$ atmospheres.

The Connecticut Associated Press, through its correspondents, has gathered a summary of the business conditions of the State as they now prevail. The result shows a considerable improvement during the past month, but business is still far below normal conditions. A great many of the works continue to run on short time; in nearly every case the hands employed are considerably below the number carried during prosperous times, while there are no records of wages being restored to what they were before the hard times set in.

The Iron and Metal Trades.

"After the elections" is the time now fixed for the frequently predicted revival. One grimly humorous Iron man suggests that then the date will be shifted to the next 29th of February.

In reality all the points brought up as bearing upon the situation are of minor significance when compared with the attitude of capital. As an old financier is quoted as saying: "There is only one thing more timid than \$100,000, and that is \$200,000." Until moneyed men again become venturesome our industries and commerce must drag along, and any happenings must simply be measured by their effect upon the courage and temper of the holders of idle dollars. It will do little permanent good to be either sanguine or impatient.

Developments in the Iron trade show a curious mixture of good and bad news. On the whole, the Eastern trade seems to feel a little more comfortable, while the West displays symptoms of weakness.

So far as Bessemer Pig is concerned, the stories of heavy purchases by Eastern buyers in Pittsburgh and the Valley should be accepted with reserve. So far as we can learn, the purchases have been only from hand to mouth, and have been on the basis of \$10 at Valley furnace, or considerably less than is quoted for Western delivery.

The Billet market is weaker, with \$15.50 quoted as the basis for sales eastward from Pittsburgh and Wheeling. Practically all the work in Eastern and Central Pennsylvania, small as to size of individual contracts but respectably large in the aggregate, is being taken by the Western mills. Low water mark on prices has been reached on a 5000-ton contract of mixed sizes.

The Wire trade throughout is in a very unsatisfactory condition, with ugly cutting of prices.

The Wire Rod market, too, is very weak and \$22.50 has become a general quotation.

Rumors are flying thick and fast in the Steel Rail trade, and an early gathering of the makers is expected. Reports of the capture of a 25,000-ton order by the Pueblo mill are very premature. It is true, however, that some negotiations are going on. It is possible that matters for next year may soon be settled. In tonnage 1895 should certainly be better than 1894, with its pitiable record up to October 1 of a little over 510,000 tons of deliveries and 610,000 tons of sales.

Quite a fair amount of tonnage is coming up in Finished Iron and Steel, particularly for the Eastern mills; but there has been no improvement in prices.

Some Southern Iron makers are crowding the markets again and have been lowering prices.

Pig Tin had some severe pounding last week and has dropped below 15¢. The Ricard syndicate seems to have a good deal against it in its bull campaign. Rumor has it that a large Copper deal is under way for the first quarter of next year. In some grades of Tin Plates a hardening tendency is developing.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, October 24, 1894.

Pig Iron.—The volume of business has fallen somewhat below the standard of the past month. Large sales are less frequent and inquiries are not so numerous. This, however, is not accepted as an indication that trade will now be dull, as October and November are almost invariably months of good business, and the general demand from all classes of foundries is expected to keep up. The great bulk of transactions is still going into the hands of Northern makers. Southern Coke Iron is in less demand than noted last week. The leading companies claim to be well sold up again through business entered in other markets, but the smaller concerns are pressing for orders in the Western field and are again quoting close prices, thus making the market weaker. Lake Superior Charcoal is quiet. Quotations are given as follows for cash.

Lake Superior Charcoal.....	\$13.00 @	\$15.00
Local Coke Foundry, No. 1....	10.25 @	11.00
Local Coke Foundry, No. 2....	10.00 @	10.25
Local Coke Foundry, No. 3....	9.50 @	10.00
Local Scotch.....	10.25 @	11.00
Ohio Strong Softeners No. 1....	13.00 @	13.50
Southern Silvery, No. 1.....	.....	.....
Southern Silvery, No. 2.....	.....	.....
Southern Coke, No. 2.....	10.50 @	10.75
Southern Coke, No. 3.....	10.00 @	10.25
Southern, No. 1 Soft.....	10.50 @	10.75
Southern, No. 2 Soft.....	10.25 @	10.50
Alabama Car Wheel.....	17.50 @	18.00
Jackson County Silvery.....	15.50 @	16.00
Other Ohio Silvery.....	14.25 @	14.50
Coke Bessemer.....	11.25 @	11.50
Coke Malleable.....	10.50 @	11.25
Spiegeleisen 20 %.....	.....	26.00

Bars.—The condition of this branch of business is well indicated by the remark of a prominent salesman, that the largest and almost only order in sight was one for 200 tons. The demand for even small lots has latterly been very slight. Little improvement is expected until the car works are better employed and implement factories increase their specifications. Mill shipments are quoted at 1¢ @ 1.05¢, Chicago, but these rates are shaded on good specifications. Guaranteed Iron is held at 1.15¢ @ 1.20¢; and Soft Steel Bars from strictly Billet stock at 1.20¢ @ 1.25¢. Jobbers' prices from stock are 1.15¢ upward for Iron, and 1.25¢ upward for Soft Steel Bars.

Structural Material.—The demand for bridge work has been fairly good, and orders are tolerably numerous for small lots of building shapes. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Angles, 1.40¢ @ 1.45¢; Tees, 1.65¢; Universal Plates, 1.40¢ @ 1.45¢. Small lots of Beams and Channels from stock, 1.75¢ @ 1.90¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

Plates.—Fair orders are being entered for Plates for bridge work and a better demand is noted from boiler and tank manufacturers. Jobbers report an excellent demand from stock. A prominent Pittsburgh mill has notified its agent here to advance prices \$2 ¢ ton, stating that its order books are now completely filled for a considerable time in the future. Other establishments, however, have not advanced their rates and we continue prices on mill shipments, Chicago delivery, as follows: Tank Steel, 1.40¢ @ 1.50¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.70¢ @ 1.80¢; Tank Steel, 1.50¢ @ 1.65¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 75 % off.

Sheets.—The demand for Black Sheets is somewhat smaller than it has been, yet the volume of this business is by no means light; mill shipments of No. 27 Common Iron unchanged at 2.35¢ @ 2.40¢, Chicago; Steel Sheets, 1.45¢ @ 1.50¢, and Galvanized Sheets, 75 and 10 and 5 % off. Sheet Copper, 14¢ base in large lots. Small lots of No. 27 Common Black Sheets from stock are selling at 2.45¢ @ 2.50¢, and Steel Sheets, 75 and 10 % off.

Merchant Steel.—No special change has occurred in this line. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.75¢ @ 1.80¢; Bessemer Machinery, 1.40¢ @ 1.45¢; Bessemer Tire, 1.40¢ @ 1.45¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

Billets and Rods.—The local Billet mills are doing so well in output that additional orders could be taken to a limited extent, on which terms will be made according to circumstances, but no general quotations are now current. The Wire Rod situation remains as stated last week, with the full capacity of the local mills under contract.

Rails and Track Supplies.—Small orders for Steel Rails are being received in fair quantities which make an aggregate of good business. Quotations are continued as follows: Standard Rails, \$25 @ \$27; Steel Splice Bars, 1.25¢ @ 1.35¢; Track Bolts, with Hexagon Nuts, 2¢ @ 2.10¢; Spikes, 1.65¢ @ 1.75¢; Links and Pins, 1.65¢ @ 1.70¢.

Old Rails and Car Wheels.—Old Iron Rails continue to be quoted at \$11, with but little business transpiring. Old Steel Rails are selling at \$7.50 for short pieces and \$10 @ \$11 for long lengths. Old Car Wheels are moving to some extent, with \$10 as the maximum price.

Scrap.—Dealers report a good demand for Old Material and exceedingly good for Cast Scrap. Fair sales have been made of Mixed Steel. They report little difficulty in selling if a reasonable price is named. The Indiana mills have recently been good buyers. Local mills are also doing well. Accumulations of Scrap here are not large, and prices are somewhat firmer. Dealers quote the following selling prices per net ton: Railroad Forge, \$9; Dealers' Forge, \$8.50; No. 1 Mill, \$7; Pipes and Flues, \$7; Axles, \$13.50; Heavy Cast, \$7.50 @ \$7.75; Stove Plates, \$5.50 @ \$6; Cast Borings, \$3.50; Wrought Turnings, \$5.50; Axle Turnings, \$6.50; Fish Plates, \$10; Horseshoes, \$9.25; Mixed Steel, gross ton, \$6; Heavy Melting Steel Scrap, \$7 @ \$7.50.

Metals.—Carload lots of Lake Copper are unchanged at 10¢. Casting brands are quotable at 9¼¢ @ 9½¢, according to brand and quality, with a fair demand. About 200 tons of Pig Lead have been sold at 2.95¢ for October and November, and additional sales at 2.90¢ for December. Spelter is firm at 3.27½¢, but quiet.

Cast Iron Pipe.—Dennis Long & Co. have contracted to supply the city of Chicago with 2000 tons of 6 to 12 inch at \$17.90, delivered. This low price was made to secure winter work, as delivery extends to March 1.

N. B. Lewis, Western agent for the Union Iron & Steel Company of Youngstown, Ohio, has removed his office to room 450 The Rookery, Chicago. The

company are manufacturers of Bar Iron and Steel, but have a particularly large Western trade in Hoops and Bands.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St.,
PHILADELPHIA, Pa., October 23, 1894.

Reports from manufacturers and dealers have been a little more favorable as regards the volume of business, but prices unfortunately show no recovery whatever. Nevertheless, the feeling is better and people are more inclined to take a cheerful view of the situation than for a long time past. It is also considered a good feature that business is coming from sources which until recently have been almost dormant, and while there is nothing heavy in any one particular line, yet the number and diversity of orders are very encouraging. Iron Plates and Skelp have been important items during the past couple of weeks, and as inquiries are still coming in the chances are that there is still more business of the same character to be placed soon. Pittsburgh is reported to be firmer on Finished Material, which if confirmed will be encouraging news to the Eastern trade. Billets are lower, however, and although Western people talk firmer prices, the fact remains that on actual business they accept less money—\$18 having been shaded on several lots for Eastern delivery. The feeling is not gloomy, however, and expectations of improvement after the elections are more general than for a long time past. Meanwhile the increase in the volume of business is considered by many to confirm their expectations on that point.

Pig Iron.—The condition of the Pig Iron market appears to be in favor of the selling interests, although the change from last week is very slight. Furnaces are well sold up, and deliveries are called for in a manner that leaves little or nothing on hand for spot demand. Consumers are, of course, amply supplied for current requirements, but new contracts at the extreme low figures recently accepted are not easily placed, and in the majority of cases are promptly declined. The increased output, aggregating 40,000 tons per week since midsummer, appears to be easily absorbed, and although there may be some slackening in the demand toward the close of the year, there is very little chance for lower prices, while the margin in the other direction appears to be wider than usual. Meanwhile consumers are not contracting for forward deliveries if anything more than a slight advance is involved, as the feeling is by no means "bullish," even at the low range of prices which now prevails. Until the elections are decided consumers are getting options as far as they can, but as already stated no heavy buying is being done at advanced quotations. Mill Irons are scarce and not easily procurable at last week's inside figures, but at 25¢ advance from the inside quotations buyers could probably get all the Iron they care to engage. Foundry grades and Bessemer are steadier, and in some cases a shade dearer, but no quotable change can be made at present. General quotations are about as follows:

Bessemer.....	\$12.75 @	\$13.00
Standard No. 1 Foundry X.....	12.50 @	12.75
Standard No. 2 Foundry X.....	11.50 @	11.75
No. 2 Plain.....	10.75 @	11.00
No. 1 Soft.....	11.50 @	11.75
No. 2 Soft.....	10.75 @	11.00
Standard Gray Forge.....	10.50 @	10.75
Ordinary.....	@	10.25

A sale of 3000 tons Alabama Iron is reported at \$10 delivered, ex ship, Philadelphia.

Muck Bars.—There is nothing doing in Muck Bars, although sellers could be found at \$18.50, f.o.b., perhaps less in some cases, but there is no inquiry and no recent sales, so far as we can find.

Steel Billets.—Consumers have at last been able to have some control over quotations. For weeks past good buyers were ready to place orders at \$18 @ \$18.25, delivered, but when makers decided to meet the market buyers reduced their bids to something less than \$18, at which price several good orders were taken, with one or two lots at the even figure. Sellers talk stronger prices to-day, but as consumers are fairly well supplied they would have no objection to prices being marked up.

Finished Material.—The market is more active than it has been for some time past, but unfortunately prices show no improvement. Pittsburgh quotations are said to be somewhat higher, which, if true, will be a great boon to this market, but in the meanwhile consumers can get all the material they want at last week's figures. The demand is larger, however, and of a more varied character including both Iron and Steel Plates, Shapes, Sheets, Skelp, Bars, &c., all of which have been taken in fair sized lots, not enough to do more than tide over the next two or three weeks, but enough to cause a better feeling in expectation of a still wider market in the near future, besides giving immediate work to mills that were beginning to need it rather badly. The general result of the week's business, therefore, may be said to be an improvement on several immediately preceding, with inquiries which seem to promise fairly for the near future. Prices, however, are very unsatisfactory, and on large lots extremely low quotations are made. For ordinary sized lots prices are usually about as follows:

Grooved Skelp.....	1.22½¢ @	1.25¢
Standard Refined Bars.....	1.20¢ @	1.25¢
Medium quality.....	1.10¢ @	1.15¢
Tank Steel.....	1.30¢ @	1.35¢
Heavy Plates.....	1.30¢ @	1.40¢
Shell.....	1.50¢ @	1.60¢
Flange.....	1.60¢ @	1.80¢
Angles.....	1.40¢ @	1.50¢
Beams and Channels.....	1.50¢ @	1.60¢

Old Material.—The demand is better, and mills are taking deliveries about as usual. New business is hard to secure, however, without some slight concession in prices, as mill products are very low, but, as a rule, the following prices, delivered, fairly represents the market:

Heavy Melting Steel.....	\$10.00 @	\$11.00
Light Melting Steel.....	8.00 @	8.50
No. 1 Wrought Scrap.....	10.00 @	11.00
Machinery Cast.....	9.00 @	10.00
Wrought Turnings.....	8.00 @	8.50
Cast Borings.....	6.00 @	6.50
Old Iron Rails.....	11.50 @	12.00
Old Car Wheels.....	9.75 @	10.25

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,
CINCINNATI, October 24, 1894.

There has been only a moderate volume of business in our home market during the week, but stocks of Southern Iron have apparently been reduced rather than otherwise. The stronger furnaces are indifferent sellers, for they

can place their current production on their contracts. There is a pretty good jobbing demand in this district, and there have been sales of some round lots to go East, the largest being 3000 tons, and so there is no urgency to sell such as would make lower prices in the past; there is quite a firm undertone to the market in general, although there are some weak spots, which are found among the weaker furnaces, but still there are no lower prices quotable, and if they have been accepted, which is doubtful, it is not admitted. The large consumers are getting all the Iron they require on previous contracts and are not purchasing now, but the current consumption appears to be equal to the production, and so there is no accumulation of stocks of consequence. The great drawback is that there has not been that increase in consumption of Southern that was hoped for. Charcoal Irons are generally neglected. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$10.25 @	\$10.75
Southern Coke, No. 2.....	9.75 @	10.00
Southern Coke, No. 3.....	9.10 @	9.25
Ohio Soft Stone Coal, No. 1.....	14.50 @	15.00
Ohio Soft Stone Coal, No. 2.....	14.00 @	14.50
Lake Superior Coke, No. 1.....	12.00 @	12.50
Lake Superior Coke, No. 2.....	11.00 @	11.50
Hanging Rock Charcoal, No. 1.....	16.00 @	16.50
Hanging Rock Charcoal, No. 2.....	15.50 @	16.00
Tennessee Charcoal, No. 1.....	13.00 @	13.50
Tennessee Charcoal, No. 2.....	12.00 @	12.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	15.75 @	16.75
Lake Superior Car Wheel and Malleable.....	14.25 @	14.75

Forge.

Gray Forge.....	8.75 @	9.00
Mottled Coke.....	8.50 @	8.75

Pittsburgh.

Office of *The Iron Age*, Hamilton Building,
PITTSBURGH, October 23, 1894.

The Iron and Steel market is in the same condition as noted last week. The volume of business is holding up fairly well in some lines, while in others it is falling off. We are now well up to the close of the year, and any better prices for the remaining two months seem out of the question. But what of next year? Will the unparalleled low prices of the last half of 1893 and the whole of 1894 prevail during 1895? It would seem that the only solution to this difficult question lies in the demand. If this should prove sufficient to give everybody work enough to keep him moderately busy, then we may hope for some improvement. Until the volume of business is sufficiently large to do this any betterment in prices cannot come. The elections next month are regarded as very important, and if the results are as expected, trade will undoubtedly be favorably influenced.

Pig Iron.—The slight stiffening in Bessemer Pig referred to last week seems to be maintained, but buyers are holding off and very few sales have been made during the last few days. The statement that a number of Eastern consumers had lately come into the market and bought considerable Pig Iron in Pittsburgh and the Valley districts lacks confirmation, and was evidently circulated for a purpose. The output of Pig is as heavy as ever, but is being taken care of and there is no disposition being shown to push the market for sales. Some of the Valley furnaces that are comfortably fixed for the balance of the year are inclined to regard \$10.50 at furnace, equal to \$11.15, Pittsburgh, as their price for Iron for prompt delivery, but no sales have been effected at that price. The demand for Gray Forge is moderate, and \$9.75, Pittsburgh, is a bottom figure. So few

furnaces are running on Mill Iron that there is no surplus. Foundry Iron is unchanged, No. 1 ruling at \$11.65, and No. 2 at \$10.75, Pittsburgh. We quote as follows:

Neutral Gray Forge.....	\$9.75 @	\$9.90 Cash.
All-Ore Mill.....	9.75 @	10.00 "
No. 1 Foundry.....	11.65 @	11.75 "
No. 2 Foundry.....	10.75 @	11.00 "
Bessemer.....	10.90 @	11.00 "

We note a sale of 200 tons of Bessemer at \$11, Pittsburgh, and one of 1000 tons of Gray Forge at \$9.75, Pittsburgh. The sale of Bessemer at \$10.15, Pittsburgh, reported last week, was off grade Iron.

Billets.—The situation is somewhat complicated. Mills are asking considerably higher prices than are quoted by some of the brokers, and the supposition is that those making the low offers are selling short. A circular has recently been sent out from this city offering Steel, either Pittsburgh or Wheeling delivery, at \$15.65. Steel for November delivery may be quoted at \$15.50 @ 15.75, at Ohio River mills, and \$15.75 @ \$16 Pittsburgh mills. Prices named by local mills have been somewhat higher for some time than those quoted by outside districts. Some inquiries are in the market for November Steel, but actual sales are very light. The shut down of the Black Plate and Tin Plate mills is being felt, and is, in a measure, responsible for the continued decline in the price of Steel.

Ferromanganese.—We repeat quotations of \$50, delivered at buyer's mill, for 80 % domestic.

Structural Material.—A contract for close to 800 tons of Bridge material for Western delivery is being figured on and will likely be closed this week. The demand for Beams keeps up and the two local mills have all they can do to get out material as fast as their customers require it. Prices are unchanged and are as follows: Beams and Channels up to 15-inch at 1.25¢ @ 1.35¢, according to order; Angles and Universal Plates, 1.15¢ @ 1.20¢, according to order, and Tees at 1.35¢.

Plates.—An increasing demand for Flange and Shell Steel from the Boiler trade is noted. The demand from the general trade is quite fair and some contracts calling for deliveries up to the end of the year have been made. Prices are ruling as follows: Tank Steel, 1.15¢ @ 1.25¢, according to order; Flange Steel, 1.30¢ @ 1.40¢, and Shell at 1.25¢ @ 1.35¢.

Bars.—The unsatisfactory condition of this trade, before referred to, continues. The demand is extremely light and does not promise to improve in the near future. When a fair sized order comes into the market, the competition to secure it inevitably results in its being taken at a very low price. We continue to quote Common Iron Bars at 0.95¢ @ 1¢, and Steel Bars at 1¢ @ 1.05¢. It is intimated that both our lower quotations have been shaded on desirable specifications.

Merchant Steel.—A slight improvement in demand is noted and some mills report that season buyers are sending in specifications. Prices show no improvement, and we quote as follows: Bessemer Machinery, 1.15¢ @ 1.25¢; Open Hearth Spring, 1.50¢ @ 1.60¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.50¢ @ 1.60¢; Sleigh Shoe, 1.50¢ @ 1.60¢; Toe Calk, 1.70¢ @ 1.75¢.

Muck Bars.—We note a sale of 200 tons of standard grade at \$18.75, delivered at buyer's mill.

Sheets.—The active demand continues, and with the mills all practically sold up for this month, and some of them into November, buyers are having considerable trouble in getting shipments as soon as wanted. Prices are very firm, and an advance may be expected before long. We quote as follows: No. 27 Common Iron, 2.25¢ @ 2.30¢; No. 27 Steel, 2.35¢ @ 2.40¢; Galvanized Sheets are ruling at 75 and 10 and 5 % off @ 75 and 10 % off, according to order.

Skelp Iron and Steel.—The demand has fallen off slightly, but prices show no noteworthy change. We quote as follows: Grooved Steel Skelp, 1.05¢ @ 1.10¢; Sheared Steel Skelp, 1.15¢ @ 1.25¢; Grooved Iron Skelp, 1.25¢ @ 1.30¢, and Sheared Iron Skelp, 1.35¢ @ 1.40¢, less 2 % cash in ten days.

Pipes and Tubes.—There is a moderate business going and some fair sized inquiries are in the market, but the big orders have been placed. Prices are lower than they were and some concerns are reported as refusing to meet some very low quotations that have been made.

Wire Rods.—Very few Rods are changing hands. We are advised of a few sales of 100 and 200 ton lots for prompt delivery at prices equal to about \$22.50, Pittsburgh.

Barb Wire.—The Wire market is in very unsatisfactory condition. The demand is light and prices are very low. It is reliably stated that several concerns have offered to sell Two and Four Point Galvanized in round lots at \$1.90, Pittsburgh, for delivery next year. Plain Wire for same delivery has been offered down to \$1.15 @ \$1.20 at maker's mill.

Wire Nails.—It is evident that the efforts of the Wire Nail makers in the direction of sustaining prices have not been as successful as anticipated. While the established price is \$1 ¢ keg at mill, we are advised that offers have been made to sell on a basis of 90¢ at mill in carload lots. Even these low offers have not stimulated the demand to any extent. The situation in Cut Nails shows no improvement, the demand being very light and prices ruling low. As stated last week, some of the larger mills are idle and are filling what orders are received from stock. We quote Cut Nails at 85¢ for usual averages.

Connellsville Coke.—The expectations of Coke makers that better prices would be secured after the first of the year are evidently not shared in by some of the Connellsville operators, as offers to sell have been made within a week on the basis of \$1 ¢ ton, for delivery during the first three months of next year. Coke for balance of this year has been offered at 90¢ ¢ ton, although a Shenango Valley furnace made a contract last week at \$1 ¢ ton, giving Pig Iron in exchange. For the week ending October 13, there were 15,036 ovens active in the Connellsville region, and 2538 idle, the production for the week in question being 142,699 tons. We quote Furnace Coke at 90¢ @ \$1 ¢ ton and Foundry Coke at \$1.05 to dealers, \$1.15 to consumers. Our quotations on Foundry Coke are occasionally shaded to consumers.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, October 24, 1894.

Pig Iron.—The situation shows decided improvement as regards the volume of business, but prices are not at all satisfactory. The heavy buying at this season would seem to indicate that prices have pretty nearly reached bottom. No. 2 Foundry has been the leader, selling at \$9.75, f.o.b. cars St. Louis. This is equal to \$7, Birmingham, and is about as low as this grade has been sold. Gray Forge shows signs of weakness, and some low prices have been made for prompt deliveries. The outlook is not very encouraging for any improvement in prices, but a steady volume of business for the balance of the year seems assured. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$10.75 @	\$11.00
Southern Coke, No. 2 Foundry.....	9.75 @	10.00
Southern Coke, No. 3 Foundry.....	9.50 @	9.75
Southern Car Wheel.....	16.50 @	17.00
Gray Forge.....	9.00 @	9.25
Ohio Softeners.....	14.00 @	14.50

Bar Iron.—The past week has been fairly satisfactory. Jobbers report a large number of small orders which in the aggregate make a creditable showing. Prices are inclined to weakness. Common Bar is quoted at 1.05¢ in carload lots.

Barb Wire.—There is no improvement in the demand. The reported agreement among the various mills has not as yet been consummated, although it is understood that everything is favorable to its final adoption. Painted is quoted at \$1.70; Galvanized, \$2.10.

Wire Nails.—A fair trade is reported, which is expected to continue at least until the present warm spell gives way to colder weather. Prices are unsettled and Nails have been offered pretty close to \$1 ¢ keg, f.o.b. St. Louis. This price would necessitate the taking of several thousand kegs, which the jobbing trade are not disposed to do at this time. Jobbers quote \$1.10 @ \$1.15, according to quantity.

Rails and Track Supplies.—The railroads are increasing their orders and are buying more heavily than for some time past. The Texas Midland bought 1000 tons 70-lb rails to be used in extending their lines. It is understood that this purchase will shortly be followed by others. Old Iron Rails are being sought for to a limited extent and \$11 @ \$11.25 is the general asking price. Track Supplies are quoted as follows: Splice Bars, 1.30¢; Spikes, 1.60¢; Bolts, Square Nuts, 1.85¢; with Hexagon Nuts, 1.95¢; Steel Links and Pins, 1.50¢; Iron, 1.60¢; Steel Rails are quoted \$26.50 @ \$27.

Pig Lead.—The Lead market does not show any signs of improvement. Spot deliveries command 2.92½¢ @ 2.95¢. The legitimate demand is only fair and so far as the speculative demand is concerned there is none.

Spelter.—The sales of this metal during the past week run largely to carload lots. The market is steady at 3.20, but there is no indication of any improvement so far as price is concerned.

Birmingham.

BIRMINGHAM, ALA., October 22, 1894.

The market shows no changes of note from last week. As one furnaceman expressed it, "We are still hanging on and see no occasion to be scared." There is a tendency to accumulation of stocks in some quarters, though some of this is for larger orders to be forwarded in a body. There is no tendency to increase outputs, which would only bear the market, and manufacturers are feeling their way cautiously. One good feature of the market is the constant demand for urgent shipments. This is shown in the Pig Iron as well as finished material lines, and indicates a healthy market. If, as seems probable now, no further material increase of production occurs within the next few months, the general feeling expressed is that we can look forward to a firmer market in February or March.

Pig Iron.—There are no changes to report. Sales are lighter than last week, though still keeping up with production. Few large sales are reported except one of 1000 tons Gray Forge at \$6 50 firm. Most orders are small and at current rates. The feature of this week's market is the firmness and heavy demand for the lower grades. No. 3 Foundry Forge and Mottled are in strong demand, and furnaces are turning to make these grades to supply the orders. As a result prices are reported firm for these grades. Mottled being very scarce, commands almost as much as Gray Forge. On the other hand, Nos. 1 and 2 Foundry are weaker; considerable shading is reported in these grades and is probably correct. The tendency to accumulate is mainly in these grades. This is an unsatisfactory condition to the furnaceman, as it cuts down his average net profits if instead of an output and sale of 80-90 % of Foundry grades he has to make the lower grades and sell at the lower prices. Collections are reported as very good. It is not probable that any more furnaces will be blown in shortly, as sales do not warrant this. There is some accumulation of stocks reported.

Manufactured Material.—While the tendency is downward yet a strong anxiety for prompt shipments would indicate a healthy feeling. This, however, does not bring with it any improvement in prices. Some cutting is reported but could not be substantiated. Sales are fair and well up to make. Sheets are in demand as last week. No movement among car works is reported. There is a gradual increase of output, but no indication of any starting up of other mills.

Financial.

The congestion of money at this center, which still continues unabated, proves that business has by no means yet returned into all its normal channels. The weekly statement of the New York Associated Banks, issued last Saturday, shows a further increase in the volume of idle money, whereby the surplus reserve is brought up \$1,666,350, leaving the amount of reserve funds held by the banks in excess of legal requirements at over \$62,500,000. Deposits during the week increased \$3,847,800, while loans expanded only \$604,300. While a part of the increase in deposits is attributed to operations between the banks and the trust companies, their large excess over the vol-

ume of loans illustrates the unnatural stagnation that exists in speculation and enterprise.

This glut of money has induced a movement among the New York banks to reduce the rate of interest allowed on country bank balances. No formal agreement has been made to this effect, owing to the danger of violating the anti-trust law by taking united action in the matter; but at least one large Wall street bank has already sent out a circular to its customers announcing that in view of the great accumulation of funds at this center, and the extremely low rates of interest obtainable, it has decided to allow interest on new deposits at the rate of 1 % per annum only. Similar action will, it is stated, be taken by other financial institutions, and it is estimated that by the end of the week nearly all the leading banks will have notified their country customers of a similar reduction, as may be concluded from this fact. The condition of the loan market has not improved. Call money continues extremely easy at 1 %, with transactions at even lower figures. There is very little demand for time money at present, while banks, trust companies and out of town financial institutions are offering it in large quantities on liberal terms as to collateral, &c. Rates are quoted at 1½ % for 30 days, 2 % for 60 days to four months, 2½ % @ 3 % for five to eight months.

Commercial paper of high grade is in excellent demand, and offerers are enabled to obtain accommodations on very favorable terms. The supply of material of this character is, however, very moderate. Indorsed bills/receivable are discounted at 2½ % @ 3 % for 60 to 90 days and 3 % @ 3½ % for four months. Prime single names are taken at 3 % @ 3½ % and good at 3½ % @ 4 %. Other notes are quoted at 4½ % @ 6 %.

The gold export movement which threatened last week to cause a large outflow of the metal was checked by the weakening of foreign exchange at the end of the week. Only \$500,000 was sent by Saturday's steamers, and no gold for export has been ordered so far this week. Large supplies of cotton bills were placed on the market, which served to fill the demand for exchange, and heavy purchases of wheat on Friday and Saturday for export—amounting, it is said, to 1,000,000 tons—created the impression that products would probably be shipped this week instead of gold. Sterling bills were offered at reduced rates at the close of last week, but a hardening tendency in rates on Tuesday, together with a cessation of the export demand for wheat and a heavier call for bills which was not entirely met by the supply, led to the expectation of further gold shipments by Saturday's outgoing steamers. There has been of late little buying of American securities by foreign houses, and this, with the restricted demand abroad for our leading staples, has produced the strength in foreign exchange which now exists, causing gold to be exported in a season when imports of the precious metal are generally looked for. At the current rates shipments of gold to Berlin can be made with profit, and but a very slight advance in exchange would enable it to be sent to London and Paris at any rate without loss.

The present condition of the money market and the exposed situation of the Government gold reserve have led to renewed talk of a further bond issue. Calculating by the present ratio of Treasury receipts and expenditures the

indications are that the month of October will show a deficit of about \$12,000,000. The receipts of gold in customs and internal revenue continue very small, and the Treasury reserve of the metal is still below the \$60,000,000 mark.

The market for sterling was strong on Wednesday, owing to a scarcity of bills, compared with the demand, and the posted rates were advanced ¼¢ on the pound. Actual business was done at \$4.86½ @ \$4.87 for 60 days, \$4.87½ for demand, \$4.88 for cables and \$4.85½ for commercial bills. Domestic exchange on New York was quoted as follows: Chicago, 10 discount; New Orleans, commercial 125 discount, bank par; San Francisco, sight 10, telegraph 12½; St. Louis, 75 discount; Charleston, buying ¼ discount, selling par; San Francisco, sight 10, telegraph 12½; St. Louis, 75¢ discount bid.

Speculation on the Stock Exchange during the week under review has been exceedingly tame, and as usual confined to operations by the professional traders. Prices of stocks, except in a few cases, show no notable change. A raid on General Electric late last week caused a decline in that stock of about three points, but the loss has been recovered in the current week. Manhattan Consolidated has experienced a fall of three points, bringing the stock down to the lowest figures reached since the panic. American Sugar has maintained its wonted activity, but closes with only a fractional change. The reduction of the half yearly dividend of the Baltimore & Ohio Railroad from 2½ % to 2 % caused a break in that stock of over five points, it being now down to 69. The statement of September earnings of the road shows a decline of 22 %, as compared with last year. The annual report of the Northern Pacific, showing an apparent deficit for the last fiscal year of \$6,500,000, has caused a fall in the preferred stocks of that road to 16. The granger issues generally have been dull but fairly strong. St. Paul was the only one of the group which showed any activity.

The bond market, relatively speaking, has made a very much better showing than the stock market. The low rates and interest obtainable and the plethora of money have naturally disposed institutions and private investors to place their money in these securities, and all the first-class issues are in good demand at high rates. Both railroad and city bonds have been active and generally strong. Government bonds have been strong and higher, the following being the closing quotations on Wednesday:

	Bid.	Asked.
2's.....	96	.....
4's, registered.....	114½	114½
4's, coupon.....	114½	115½
5's, registered.....	118½	119
5's, coupon.....	119½	120½

New York.

Office of The Iron Age, 96-102 Reed street, }
New York, October 24, 1894. }

Pig Iron.—Current business is on a fair scale, but no large sales are reported in this immediate vicinity. Very little is being done in the Cast Iron Pipe trade, the only larger order closed lately being about 1800 tons for Beaver Falls, Pa., taken at \$19, delivered, by the Addyston works. We quote standard brands \$12.50 @ \$13 for No. 1; \$11 @ \$12 for No. 2; \$10.50 @ \$11 for No. 2 Plain, at tide-water. Southern Iron, same delivery, \$11.50 @ \$12 for No. 1; \$10.75 @

\$11.25 for No. 2; \$10.25 @ \$10.75 for No. 3; \$10.50 @ \$10.75 for No. 2 Soft, and \$10.75 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$10 @ \$10.40.

Spiegeleisen and Ferromanganese.—In the absence of business we quote nominally \$20.50 @ \$21 for 20% Spiegeleisen and \$48 @ \$50 for Ferromanganese, tidewater.

Billets and Rods.—Very little is doing in Billets, which are quoted \$18 @ \$18.25, delivered. Wire Rods are decidedly weaker at \$25 @ \$25.50, tidewater, for domestic.

Steel Rails.—Eastern mills are doing only a moderate business for quick delivery, the largest sale of the week having been one lot of 1000 tons. The report of a sale of 25,000 tons by the Pueblo mill is pronounced premature by the officers of the company. The rumor of a sale of 7000 tons lacks confirmation. Only a moderate amount of new work for early delivery is coming up in Girder Rails, but there are indications of quite a heavy business for next spring.

Track Material.—We quote as follows for small lots: Spikes, 1.50¢ @ 1.70¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

Manufactured Iron and Steel.—Only one small contract involving about 250 tons of Beams was given out this week. Up to this writing the work for the Guggenheimer Building, with about 5000 tons of Iron and Steel, has not been awarded. The New England bridge shops are reported as doing very little work, and some of them have been turning to architectural construction. The Plate trade continues very light. Some interest is taken in the stories that the Standard Oil Company will build a large new distributing plant for New England near Norwalk. This ought to involve a good deal of Tank work. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.25¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.35¢ @ 1.50¢, on dock. Steel Plates are 1.25¢ @ 1.40¢ for Tank; 1.40¢ @ 1.50¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.15¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.15¢; Soft Steel Bars are 1.10¢ @ 1.30¢; Scrap Axles are quotable at 1.30¢ @ 1.50¢, delivered; Steel Axles, 1.30¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 67¢ @ 75¢ @ 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.60¢ @ 1.70¢, and Sleigh Shoe, 1.15¢ @ 1.25¢; Tire, 1.25¢ @ 1.30¢, and Spring, 1.65¢ @ 1.70¢, delivered.

Houghton & Richards, Iron and Steel merchants, of 150 Oliver street, Boston, are agents for Styrian Tool Steels, made with vegetable fuel exclusively. The New Process Drill Company used the steel in turning 55 feet of drill shanks.

The Steel Rail Supply Company, Humphreys & Sayce, managers, 10 Wall street, have issued a new edition of their pamphlet on Track Material, which contains a valuable series of tables of weights and of useful information.

Metal Market.

Pig Tin.—Since the date of our last report prices for Straits Tin have dropped about $\frac{1}{4}$ ¢ @ $\frac{1}{2}$ ¢. Prompt and October delivery went at as low as 14.80¢, as per official record. Rumor had it that some trades were effected quietly at a shade under that. On the decline about 500 tons changed hands, including contracts for deliveries up to and including April, 1895, at 14.90¢. Subsequent reaction, due chiefly to covering of "shorts" and nicely timed manipulation, carried prices a fraction above the lowest point; but the weight of heavy supplies, to say nothing of clever work by the "bearish" interest in the speculative branch of the trade, prevented anything more than a feeble rally. Early in the week good purchases were made by consumers and jobbers. Latterly orders from those sources have been rather light, chiefly because of the demoralized condition of the market and intimations that the syndicate has shifted its burden where it may or may not be well taken care of. Apropos of the syndicate maneuvers, it may be interesting to note that Tin is cheaper now than when the brilliant deal was under full headway. There is more Tin to be taken care of, as well; probably more than the regular statistics would indicate. Wednesday's market up to the time of writing was somewhat ragged, with spot stock offered at 14.90¢, October and November at 14.92 $\frac{1}{2}$ ¢ and December at 14.95¢.

Copper.—Dealings have been on a moderate scale. The demand has shown no spirit whatever. In fact, hardly any movement has taken place aside from deliveries on old contracts, although lower prices have been made in a few instances to attract new business. For example, a few sales of Lake Superior Ingot were made at 9.62 $\frac{1}{2}$ ¢. Subsequently that price was shaded to 9.60¢ by other sellers, with the result of securing a few orders for moderate quantities on cash terms, while small parcels were parted with at 9.70¢ on more liberal terms. There is some talk of another large deal being made between leading producers and large consumers for deliveries extending into the first quarter of next year, at or about 9.50¢, but confirmation of the same is, as usual with such deals, not forthcoming. Electrolytic is freely offered at 9.50¢, and the indications are that some brands could be secured at a shade less. Common casting stock is quoted at 9.20¢ @ 9.30¢, as to brand, but those prices seem to be rather above the trading basis for round lots.

Pig Lead.—Opportunity has been offered buyers to duplicate purchases at prices that were accepted last week for round lots, shipment this month or next, from primal point. A few carloads were taken, but buying interest generally has been very tame, and the market is, at this writing, showing rather weak tone. There is no difficulty about purchasing single carloads at 3.12 $\frac{1}{2}$ ¢. Some have been secured at 3.10¢. For large lots, bids above 3.05¢ are strictly the exception, and it is the fact that large consumers are very indifferent about trading on that basis. Their peg has been put at 3¢ for the time being on round lots, and it is possible that the former means of bringing prices to a certain level by purchasing foreign Lead in case of need may be resorted to. To say the best about it, the market has a weakish appearance.

Spelter.—A certain amount of strong statistical position is claimed for this metal. Eastern consumers are very indifferent buyers, however, and it is yet the fact that no advance on 3.40¢ @ 3.45¢ for ordinary Western brands has been obtained here. Relatively better prices do not appear to have been secured in other quarters, although Western purchases have doubtless been relatively larger.

Antimony.—A very fair jobbing business has been effected. Otherwise little movement has taken place. Prices remain steady at about 7 $\frac{3}{4}$ ¢ @ 7 $\frac{1}{2}$ ¢ for Hallett's and 9 $\frac{3}{4}$ ¢ @ 9 $\frac{1}{2}$ ¢ for Cookson's.

Nickel.—The market is unchanged. Prices are still irregular, with the range of 35¢ @ 42¢, as to quality and quantity, still quoted.

Tin Plate.—A very fair spot business has been done at slightly irregular prices. Ordinary Cokes have been taken more liberally for future delivery, and some improvement is noted also in orders for bright Charcoals, the spot supply and assortment of which is rather poor. Because of scarcity, Charcoals have realized higher prices on the spot. Ordinary Cokes, on the other hand, being more plentiful, are a shade off. Ternes have remained almost stationary. A more settled market is looked for when the liberal supplies in transit arrive, and the prospects are that something unforeseen must happen to carry prices higher. Spot stock may be secured at the following prices: Charcoal Tins: Allaway Grade, IC 14 x 20, \$4.25; IX 14 x 20, \$5 @ \$5.05; IC Melyn, 14 x 20, \$5; IX Melyn, 14 x 20, \$6.50; IC Lisvane, &c., 14 x 20, \$4.25; IX Lisvane, &c., 14 x 20, \$5.25. Coke Tins, Bessemer Steel, IC 14 x 20, full weight, \$4 1 $\frac{1}{4}$; 100 lb, \$3.80; 95 lb, \$3 67 $\frac{1}{4}$; 90 lb, \$3 60; Bessemer squares, full weight, \$4 30 basis; 100 lb, \$4 basis; Siemens Steel, IC squares, full weight, \$4.35 basis; 100 lb, \$4.10 basis. Charcoal Ternes: M. F., IC 14 x 20, \$6; IC 20 x 28, \$12; Worcester, IC 14 x 20, \$4.75; IC 20 x 28, \$8 60; Dean, IC 14 x 20, \$4.05; IC 20 x 28, \$8.10; 100 lb, IC 14 x 20, \$3 90; IC 20 x 28, \$7.80; D. R. D. Grade, IC 14 x 20, \$3.90; IC 20 x 28, \$7.85; 100 lb, IC 14 x 20, \$3 85.

British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, October 24, 1894.

There has been a fall of about £2.10/ in prices of Straits Tin during the week, and heavy sales were made, particularly of futures, in the face of moderate Straits shipments during the first half of the month and liberal purchases by the syndicate. The break was caused primarily by reports of free Eastern offerings and absence of outside support, together with weak American advices. After realizations the market improved somewhat, but is still in a nervous state. Latest dealings were at about £68. 5/ for prompts and £68. 12/6 for three months' futures.

Copper receded slightly in price under somewhat adverse statistical position and realizing of profits by speculators. Consumers have purchased moderately. Merchant Bar prompts touched £40. 10/. Some improvement in purchases of futures has taken place dur-

ing the past few days and the market has hardened. Late dealings in Merchant Bars were at £40. 15/ for prompts and £41. 2/6 for three months' futures. Best selected English quoted at £43. 15/ @ £44.

Tin Plate has been dull and weak. Sellers more plentiful and pressing. Wasters and Ternes particularly. More interest shown in light weight Cokes the last few days, but purchases confined mostly to rather small lots. Large amounts of Plate are loading for 'Frisco without affecting the market, as stocks increase under recent increased production. The Earlswood works are restarting. Swansea quotations are as follows:

Bessemer Cokes, IC.....	10/ @
Siemens Cokes, IC.....	10/8 @
J. B. Steel Cokes, IC.....	10/ @
Dean Ternes, 20 x 28	20/ @
Charcoals, IC.....	11/ up.

Pig Lead is easier and selling slowly. Business has been done at £9. 15/ for Soft Spanish, and corresponding prices for other kinds.

Spelter has undergone a slight decline and the market is easy, with £15 @ £15. 2/6 quoted for ordinary Silesian.

Pig Iron warrants have undergone very little change. Latest dealings were at 42/6 for Scotch, 35/6 for Cleveland and 43/6 for Hematite.

The Production of Open Hearth Steel in England.

The total production of open hearth steel in the United Kingdom for the first half of 1894 has been ascertained by the British Iron Trade Association to amount to the exceptional quantity of 1,029,409 tons. This is the largest quantity that has ever been produced by the open hearth steel industry in any half year in the history of the trade, and is at the rate of not less than 2,058,818 tons a year. This output places the open hearth considerably ahead of the Bessemer steel industry in reference to the extent of its production, inasmuch as the output of Bessemer steel for the first half of the year, as already shown, was not more than 810,392 tons. The output of open hearth steel during the half year has therefore been at the rate of over 436,000 tons a year in excess of the production of Bessemer steel for the same period. Of the two descriptions of steel, taken together, the output for the half year has been 1,839,801 tons, or at the rate of 3,679,602 tons. If this rate of production were maintained during the second half of the year, it would place the year 1894 at the head of the most productive years that have ever been experienced in the British steel industry, the years that would come nearest it in this respect being 1889, when our total production of the two descriptions of steel was 3,569,000 tons, and the year 1890, when we similarly produced 3,579,000 tons, the items being as under:

	1889.	1890.
	Tons.	Tons.
Bessemer steel.....	2,140,000	2,015,000
Open hearth steel.....	1,429,000	1,564,000
Totals.....	3,569,000	3,579,000

It is quite evident from this showing that the output of Bessemer steel has considerably fallen off, while the make

of open-hearth steel has largely increased, at any rate in the first half of the current year. It is tolerably certain that the returns for the second half of the year will not confirm this favorable showing, for it appears that a number of the leading steel works in Scotland have been idle for something like three months past, owing to the strike of miners there; and it would not be surprising, therefore, to find that the output for the second half of the year in Scotland was not more than one-half of the output for the first half of the year, due to that stoppage, which has now been carried on for nearly four months, and has caused the great majority of the works to be entirely closed.

The quantity of acid open hearth steel produced in the first half of the year was 956,871 tons, while the output of basic open hearth steel was 72,538 tons. In the two principal producing districts—Cleveland and Scotland—the production was almost wholly acid steel, and in Wales only one firm has been engaged in the manufacture of basic steel. The quantities of each description produced in the first half of the year are appended:

I.—Statement Showing the Production of Open Hearth Steel Ingots in the Several Districts in the First Half of 1894.

Districts.	Acid tons.	Basic tons.
Scotland.....	329,645	2,835
Northeast coast.....	314,618	2,940
North and South Wales.....	154,672	20,084
Sheffield, &c.....	69,703	8,446
Lancashire and Cumberland.....	58,758	7,619
Staffordshire.....	31,475	30,614
Totals.....	956,871	72,538

The quantities of each different manufacture produced in the first half of the year were as under, so far as returns have been received:

	Tons.
Plates and angles.....	417,732
Bars, &c.....	183,493
Blooms and billets.....	164,334
Forgings.....	28,770
Castings.....	20,927
Rails.....	15,406
Tires, &c.....	15,000
Total.....	845,662

In this case we have 17 per cent. less of the finished products than we have of ingots; but as nearly 12 per cent. of that quantity will be absorbed in loss by conversion and wasters, the total output may be regarded as accounted for within about 5 per cent.

The total number of open hearth furnaces now erected in Great Britain is 353, of which 296 are returned as erected for the acid and 57 for the basic process. In 1880 the number erected was only 129, and in 1890 it was 329, so that the industry continues to make progress. During the first half of the year 210 acid and 34 basic furnaces were at work.

The directors of the United States Express Company have passed their usual dividend on account of a heavy falling off in the traffic and, consequently, in the earnings of the company, owing to the recent strikes upon the railroads and the depression in the general business of the country.

Secretary Herbert has resolved to make Key West, Fla., a regular coaling station for all the vessels of the United States Navy cruising in its vicinity. The cruiser "Montgomery" will be employed for some months cruising in the waters of the Gulf with the object of making tests of various kinds of Southern steam coal supplied for the purpose.

The Iron Ores of the Mediterranean Seaboard.—I.*

BY A. P. WILSON, ASSOC. M. INST. C. E., F. G. S.

The Vizcayan deposits, from which such large quantities of iron ore have been produced for the past 20 years, are undoubtedly becoming exhausted, and while the quality of the ores from this district is already deteriorating the output cannot be maintained at its present figure of between 4,000,000 and 5,000,000 tons for many more years. Indeed it has been said on good authority that in five years a large proportion of the mines on the north coast of Spain will have been entirely worked out. Although similar predictions have been current for several years it is evident that the fulfillment must now be more closely approaching. Altogether about 56,000,000 tons have been raised in the Bilbao district since the year 1860.

The question, therefore, as to what districts are destined to fill the place of those which are becoming exhausted, is one of absorbing interest to the iron and steel makers of this country.

In the opinion of the writer, the iron ore producing provinces of the South of Spain, and especially those of the province of Almeria, will unquestionably play a large part in the immediate future as exporters of iron ore. The ores from this province are already fairly well known and the output, which at present is steadily growing, will shortly increase with great rapidity. Several purchases of mines in the Southern provinces of Spain have been made during the last two years, chiefly by Bilbao mine owners, and as soon as these properties have been opened up, and transport to the coast has been provided for, a great and sudden increase in the quantity of iron ore exported from these provinces may be confidently predicted.

There are ores of every class in the Southern districts—brown hematites, low in iron, high in water, both free and combined, and producing about 80 per cent. of smalls; hard purple hematites, carrying 55 per cent. of iron and 3 to 4 per cent. of manganese, 80 per cent. being lumps; and magniferous ores containing over 50 per cent. of iron, and 12 per cent. of manganese.

The principal iron ore producing provinces of the South of Spain are Murcia, Almeria and Malaga, and the production for the past three years has been as follows:

	1891.	1892.	1893.
	Tons.	Tons.	Tons.
Murcia.....	350,000	388,000	300,000
Almeria.....	163,224	174,350	115,000
Malaga.....	99,589	70,700	55,000
Totals.....	612,813	633,050	470,000

It will be seen that the production of the whole of the South of Spain is at present only from one-sixth to one-eighth of that of Vizcaya alone, but year by year as the produce of the latter declines that of the former may be expected to increase, and the outputs of the North and South will gradually approach one another.

The deposits, however, of the Southern provinces are not in any way so extensive as that of Bilbao. It is prob-

* Read at the Brussels meeting of the Iron and Steel Institute.

able that all the workable deposits at present known in the South do not contain more than one-half the quantity of ore that was once available in the Bilbao mines. On the other hand, however, the mines of the South have several advantages over those of the North—labor there is considerably cheaper, the climate is much drier, and freights, taking the average of the whole year, are not in excess of those which are paid from the nearer port of Bilbao. A large proportion of the ore, too, is superior to the Bilbao ores, the Southern Campañil being of better quality than the average Bilbao Campañil, in that it contains more iron and less silica, while the Northern district cannot boast of such ores as the manganiferous ores of Herrerias in Almeria and of the Cartagena district in Murcia.

The lowness of Mediterranean freights is accounted for by the fact that larger steamers can load at ports on the southern coast of Spain than at Bilbao, which is known to be a shallow water port; moreover, the amount of dispatch money earned under charters of steamers from the South of Spain is very large, amounting to 2 shillings per ton or thereabouts. This dispatch is not earned from steamers which load at Bilbao. An estimate was made and an average taken of the freights paid from the South of Spain to the east coast of England, and it was found, after taking into consideration the profits under the charter party, that the freight from the South of Spain for that period was somewhat less than that paid from Bilbao. At the present moment the freight from Bilbao to Middlesborough is between 5 shillings and 5 shillings 6 pence, while from the South of Spain ports, such as Garrucha and Almeria, it is 8 shillings 3 pence, a difference at first sight, therefore, of 3 shillings per ton in favor of Bilbao, but when it is considered that steamers from the South of Spain pay 10 pence per ton for loading and 10 shillings per hour dispatch at both ends, which, as mentioned before, is worth 2 shillings per ton, and that they also pay a higher rate for discharging than the actual cost, it will be seen that the emoluments under charters from the South of Spain amount to more than 3 shillings per ton. As the tonnage of the world is increasing rather than decreasing in size, it is only fair to suppose that the difference in favor of the South of Spain will be further demonstrated as time goes on.

The principal iron ore mining centers in the South of Spain are:

Cartagena, Calasparra, Morata and the Sierra Enmedio, in the province of Murcia; Herrerias, Sierra de Bédar and Sierra Alhamilla, in the province of Almeria, and Marbella, Robledal and Estepona, in the province of Malaga.

Province of Murcia.

In the province of Murcia the Porman deposits of iron ore near Cartagena are so well known as an existing source of iron ore for industrial purposes that no time need be taken up in describing them. In the interior of this province, however, there are large deposits as yet unopened, and little known to the commercial world. Their remoteness from any shipping port severely handicaps them, however, in competing with seaboard ores, but, since with improved facilities for transport they may ultimately become available for export, a brief notice of them here may not be out of place. The deposits referred to, known locally as the Calasparra iron ore deposits, consist

of four separate groups of mines occurring in the form of an arc of a circle 20 km. long, the mineral concessions covering an area of 430 hectares. The largest of these groups is near the station of Calasparra, on the Cartagena & Madrid Railway, 140 km. from Cartagena.

Both red hematite and magnetic oxide occur, and both ores are hard and compact. An average sample of each kind gave:

	Red hematite.	Magnetite.
	Per cent.	Per cent.
Silica and insoluble.....	1.87	10.16
Sulphur.....	0.054	0.019
Phosphorus.....	traces.	0.241
Metallic iron.....	57.00	54.00

All these deposits can be worked on the open cast system.

The railway carriage from Calasparra to Cartagena amounts to 4.95 pesetas per ton, and when the mines have been connected with the railway at Calasparra it is estimated the total cost of the ore on board at Cartagena will amount to 9.30 pesetas per ton, thus:

	Pesetas.
Mining.....	1.50
Transport by cable.....	0.25
Transport by narrow gauge.....	1.00
Automatic loading.....	0.10
Rail to Cartagena.....	4.95
Storage.....	0.50
Loading on steamer.....	1.00
General charges.....	0.50
Total.....	9.80

At the current rate of exchange this is equal to about 5 shillings and 10 pence per ton.

Morata.

Some 45 km. west of Cartagena, and at a distance of 17 km. from the coast, the deposits of Morata are met with, occupying valleys formed by the Sierra Almenara, and branches or spurs of the same, and extending southward toward the Sierra Enmedio. The mineral concessions cover an area of nearly 500 hectares, and the available supply of iron ore has been variously estimated at 4,000,000, 5,000,000 and 8,000,000 tons, though until the deposits have been more extensively opened up it is impossible to give anything but a minimum estimate. The output from this district is at the present time very much reduced, the annual production not exceeding 12,000 to 15,000 tons, and this from one mine only, where the mineral is gained by underground workings. The mines suffer the great disadvantage of not having direct communication with the coast. The ore is carted to Parazuelos, an open roadstead, and the steamers are loaded by means of barges. Notwithstanding these difficulties the cost of the ore, put on board, does not exceed 6 pesetas (say 3 shillings and 10½ pence) per ton. The ore is red hematite, and the outcrops are numerous and can be traced for considerable distances, though some have been proved only to a depth of 8 m. The various deposits have a general direction of northwest to southeast.

The following is an average analysis of the ore, dried at 212° F.:

	Percent.
Peroxide of iron.....	72.00
Protoxide of iron.....	nil.
Peroxide of manganese.....	2.96
Alumina.....	0.80
Lime.....	7.28
Magnesia.....	1.30
Baryta.....	0.07
Silica.....	4.30
Sulphur.....	0.02
Phosphoric acid.....	0.03
Oxide of zinc.....	0.03
Carbonic anhydride.....	7.10
Combined water.....	4.00

Total..... 99.89

Iron in the dry.....	50.40
Iron in the raw.....	47.89
Moisture.....	4.99

Most of the outcrops can be worked by the open cast system.

A railway of 17 km. has been proposed to the port of Cueva-Lobo, which is stated to be a better loading place than Parazuelos, the various mines being connected with the landward terminus by a series of inclined planes and cable ways. When these have been established it is calculated that the cost of the mineral will be as follows:

	Pesetas.
Getting, &c.....	2.000
Transport to Cueva-Lobo.....	1.035
Putting on board.....	0.500
Incidental expenses.....	0.200
Total.....	3.705

exclusive of royalty and administration expenses.

At current exchange this is equal to about 2 shillings and 4½ pence per ton.

Sierra Enmedio.

This district has been a somewhat disappointing one, the estimates of quantity, based upon surface indications, not having been realized in depth. The development of these mines was commenced five years ago, but at present only one mine, the Santa Isobel, is in active operation. This mine is worked by open cast and maintains an average annual output of about 25,000 tons. The shipping port is Aguilas, with which the Enmedio mining district is connected by means of the Great Southern of Spain Railway, a distance of 31 km., while the Santa Isobel Mine is connected with this railway by a Decazeville railway 3 km. in length.

The ore is a red hematite of excellent quality, and is nearly all lumps. The following shows the average contents:

Iron in the dry.....	about 50 per cent.
Manganese in the dry.....	from 1.00 to 1.50 per cent.
Silica.....	from 1.50 to 2.50 per cent.
Sulphur.....	traces to 0.002 per cent.
Phosphorus.....	traces to 0.002 per cent.
Moisture.....	from 0.50 to 5.00 per cent.

*According to the time of the year.

Notwithstanding that Aguilas has a good harbor, with pier and loading jetties, along which the railway is laid, the loading facilities are not of the most economical kind. The ore is tipped from the railway wagons onto the jetty, is there loaded into cars, moved a short distance, then shoveled from the carts into the steamers which lie alongside. In this way 800 to 900 tons can be loaded per day. Steamers up to 3000 tons can lie alongside, and steamers of over 4000 tons have been loaded, but these have to lie some distance away from the jetty.

The cost of the ore put on board ship at Aguilas may be taken at about 6 shillings per ton, which includes 2.17 pesetas for railway carriage. Freights from Aguilas to England are rather higher than from other South of Spain ports, on account of the high harbor dues.

Petroleum exports from the United States in the month of September were 75,656,000 gallons, as compared with 81,526,000 in the corresponding month last year. Total exports since January 1, 1894, have been 650,971,000 gallons, against 644,304,000 gallons in the first nine months of 1893.

The steam whaler "Norwhal," which arrived recently at San Francisco from the Arctic Sea, reported a catch of 69 whales, valued at nearly \$500,000.

HARDWARE.

Condition of Trade.

REPORTS as to the volume of business still indicate a good deal of irregularity and unevenness, some sections and some houses experiencing a considerably better demand than others. From many parts of the West and South and Southwest reports are very gratifying, but in portions of the East business is not in quite so satisfactory a condition. There is, however, on the whole little reason for complaint, and it is evident that a great many goods are moving, most of them in comparatively small parcels.

Prices are not strong and in many lines lower quotations are ruling than some time ago. The fact that goods are thus cheap and with a declining tendency keeps down the aggregate of business, as expressed in dollars and cents, and the state of the market is at the same time such as to deter buyers from purchasing beyond their immediate requirements. There is, however, apparently a gradual and steady improvement in the business situation, and it is believed that the foundation is being laid for a good trade in the future.

Chicago.

(By Telegraph.)

The movement in Shelf Hardware and related articles keeps well up to the volume of the first half of the month. Sales will therefore be considerably in excess of those of September. This is attributed to the conservative buying in August for future delivery, which was not so conspicuous a feature this year as previously. Merchants are being compelled to buy frequently now in order to supply their customers. Winter goods are doing quite well, and a better demand than expected is noted for Holiday Goods, Table and Pocket Cutlery, Silver Plated Ware, &c. The demand for staple goods has also improved to some extent, and even Barb Wire is moving better. Tinware and Tinnery Stock are doing satisfactorily. Aluminum Ware is winning its way remarkably well, considering its higher cost compared with Tin or Enamelled Ware. Some manufacturers are hardly able to keep up their stock to meet the demand.

St. Louis.

(By Telegraph.)

The Hardware jobbing trade have very little reason for complaint. Business continues in the satisfactory condition last noted, and if prices would only improve somewhat there would be no complaint whatever. There is a slight falling off in the volume of orders from the South, but as this is generally expected at this season of the year, there is no inclination to worry over it. What is bothering the jobbing trade just now is the warm weather at present prevailing throughout this section; the last week in October and the thermometer registering from 85° to 88° in the shade. A return of the cold weather experienced in the early part of October means a return of the demand for cold weather goods, which was phenomenally large up to the time the warm weather set in. Prices continue to show signs of weakness, and it seems impossible to find anything to quote which shows an advance. Even staple goods are showing signs of weakness. A favorable feature of the market is the increased buying by railroads, which, if continued, will certainly have its effect on the entire Steel line and kindred lines. Collections are satisfactory.

Notes on Prices.

Wire Nails.—There is a good deal of inquiry and a fair volume of business. The market is, however, in an unsettled state and characterized by a rather weak tone. In the matter of price it is represented by the quotation of 95 cents for carload lots at mill, but this figure is shaded more or less freely, some of the manufacturers quoting as low as 90 cents, f.o.b. factory. Competition between the manufacturers is active.

Chicago, by Telegraph.—The inquiry has considerably increased during the past week. Merchants show an inclination to stock up, especially in localities which may be affected by the closing of navigation. It would not be surprising if some heavy transactions should take place within the next week or two on this account. Manufacturers' prices are somewhat irregular, owing to low water rates from Eastern lake ports, but this is regarded as only a temporary matter which will soon correct itself. Factory prices to the general Western trade are being based on \$1.10, Chicago. Jobbers report a good demand for small lots from stock and continue to quote at \$1.10.

Cut Nails.—The demand for Cut Nails continues good, though not as

large as it was a little while ago. There is not much change in price, but the market is not quite as strong as it has been. Quotations are still fairly represented by 90 cents for carload lots on dock, New York, 60-cent average. Quotations are, however, made more frequently f.o.b. at mill than has recently been the case. Small lots from store in New York are quoted at \$1.05 to \$1.10, with the usual average.

Chicago, by Telegraph.—Manufacturers report a continued demand for small lots, which keeps their volume of business up to the average of the past month. Quotations on factory lots are unchanged at 90 cents, Chicago, for 60-cent averages. Jobbers are selling small lots from stock at \$1.

Barb Wire.—There is not much movement in Barb Wire at present, but inquiries for future delivery are coming in more freely. The market is somewhat weak and slightly lower prices than have recently prevailed are being quoted. The market is represented by the following quotations on Four-Point Galvanized in carload lots, at the points named: Pittsburgh, \$1.95 to \$2; Cleveland, \$2 to \$2.05; Cincinnati, Allentown, Chicago and New York, \$2.10 to \$2.15.

Chicago, by Telegraph.—Spring orders are now being booked to some extent by the local factories, and prospects are excellent for a good volume of business of this character. Fall trade, however, is quite light and not much is received by manufacturers in the way of orders for immediate shipment. Jobbers are quoting small lots of Galvanized from stock at \$2.25, while direct shipments from factory are being made at \$2.15. They report an improvement in sales of small lots.

Towel Rails.—The Reversible Polished Brass Towel Rails put on the market by Robert Ferguson, 51 Mercer street, New York, and illustrated among the novelties in this issue, are sold to the trade at \$53 per gross, subject to a discount of 50 per cent.

Electric Folding Hack Saw Frame.—These Frames were described in our last issue. They are put on the market by Frasse & Co., 19 Warren street, New York, who are selling them to the trade from the following list, which is subject to a discount of 15 per cent.:

Per doz.		Per doz.	
No. 1.....	\$6.00	No. 3.....	\$12.00
No. 2.....	12.00	No. 4.....	13.80

Cast Steel Garden Weeder.—This implement was described in *The Iron Age* of October 11, as put on the mar-

ket by Sheble & Klemm, Frankford, Philadelphia, Pa. The Weeders are sold to the trade at a discount of 60 to 60 and 10 and 2 per cent. from the Philadelphia list, and 70 to 70, 5 and 2 per cent. from the Western list.

Line Fasteners.—Christensen's Line Fasteners, manufactured by Herman C. Larsen, 23 East Fourteenth street, New York, an illustrated description of which appeared in our issue of last week, are sold at \$9 per gross, net.

Glass.—There are no encouraging features in the American Glass market for the manufacturers, nor is a falling market a desirable one for the merchant. Prices continue irregular and weak, while the number of Glass factories in operation continues gradually to increase. Trade is quiet and only immediate requirements are being provided for. The number of pots, or their equivalent, in operation are given as 1062, an increase of a little over 500 during the past month. Pittsburgh quotations are reported as being 88 per cent. discount for single, and 90 per cent. discount for double strength Glass in carload lots, with slight concessions for larger quantities. Jobbers are quoting from 85 and 10 to 85 and 15 per cent. discount for single, and 85 and 20 per cent. discount for double strength Glass. If these prices continue to rule it is difficult to see how factories with pots can continue in successful operation. Tank factories have a decided advantage in the lower cost of producing Glass. There is nothing new in the American Plate Glass situation. Plate Glass is moving in satisfactory quantities and prices remain unchanged. Imported Glass is firm at 60 and 10 and 5 to 70 per cent. discount in any quantity, from the new list of October 1, 1894.

Bicycle Notes.

The Price of Bicycles for 1895.

THE QUESTION as to what the price of standard makes of Bicycles will be for 1895 is an interesting one for both dealers and riders, and particularly so for Hardware merchants who have found the addition of Bicycles to their stocks a profitable investment, and also to those who anticipate handling this line during the coming season. Many manufacturers have recognized the Hardware trade as the most legitimate and satisfactory channel for marketing their output of Cycles, and the coming year probably more than ever before, the Hardware merchant will be solicited by the maker.

The makers of standard machines delayed making known their prices for 1894 until late in the season of 1893, being very reticent on the subject; apparently deferring making any announcement until they discovered what policy in regard to prices was to

be pursued by their competitors. Among the first manufacturers to make their prices known to the trade for 1894 were the Overman Wheel Company, Chicopee Falls, Mass., and E. C. Stearns & Co., Syracuse, N. Y. Other manufacturers followed by making known their prices, in some cases grading their machines in value according to their weight. To remove any uncertainty in the minds of the trade and the public generally in regard to the desirability of Bicycles at the lower prices, the manufacturers who reduced the list on their machines emphasized the statement that 1894 prices would not affect the quality of their product, and that neither material nor construction would in any case be sacrificed on this account.

It is an open secret that list prices have not been strictly adhered to by agents and dealers, however much manufacturers may have desired that these prices should be the only ones known to riders. If any change in prices is contemplated for the coming season, it is unreasonable to suppose that it is the intention of manufacturers to make any advance on those of 1894, and it may be that somewhat lower prices will prevail. Competition is active and aggressive, and the output for the coming season will be larger than for the past season, and with increased facilities and improved machinery, the cost of manufacturing has been decreased. The larger output of Cycles has allowed the buying or manufacturing of material and parts in larger quantities, which has also somewhat lessened costs.

The remunerative prices which have been obtained for Bicycles by the makers in the past have been of advantage to the rider, as they have allowed the manufacturers to adopt improvements in material and construction, and in fact to turn out machines the best in every respect, and it may be that with the constantly increasing demand the price for standard machines will remain as it is, while there will doubtless be a large and growing sale of machines which, though good and reliable, are not in the first rank as regards finish and price.

At the present time it is impossible to make a statement in regard to 1895 prices, the matter being still an open one; but the disposition on the part of the makers seems to be to maintain the past season's prices on high grade machines.

It is to be hoped that a decision by the leading manufacturers may not be deferred too long, as uncertainty in regard to the matter will have an injurious effect on the trade.

The Bicycle Industry.

The manufacture of Bicycles has already become an important industry. It is but a short since that a few large establishments were in the field, and they seemed abundantly able to supply the demand then existing. But the use of the Bicycle took a decided impetus with the introduction of the so-called safety, and the field became an inviting

one for capital and enterprise. Bicycle factories are now spreading all over the country, several new ones being announced which will be in the field next season. It has been a boon to makers of machinery, as the new factories have furnished an outlet for some of them which has been badly needed during the depression in general business.

It would seem as if the Bicycle trade was in danger of being overdone, but this may be a mistaken view, as the use of these vehicles is steadily growing despite the hard times, and will, of course, grow faster whenever the times improve. It is also estimated by leading manufacturers that no less than one-fifth of their annual output goes into the hands of persons who do not use a wheel longer than one season but buy a new one every year. This increases the consumption beyond what would naturally be expected.

Lines of Hardware Paying a Good Profit.

THE W. BINGHAM COMPANY, Cleveland, Ohio, in their October letter "from the Corner Desk," call attention to the desirability of Hardware merchants taking up lines of goods that pay the old time profit, and that have hitherto been considered as belonging to other branches of business. The suggestions are in part as follows:

Cycles, Sporting Goods, &c.

A number have taken up with Cycles, some have added Sporting Goods, others have increased their line of House Furnishing Goods by adding many outside articles, &c., and it is in these changes and the transformation of the modern Hardware store that the reconstruction consists. The goods that are being taken up are generally such as add to the attractiveness of the store, and when the trade gets finally settled upon its new basis it will be found to be the gainer in more ways than one.

Cutlery.

The Cutlery show case furnishes, perhaps, the most ready inlet for new goods. In the first place, Cutlery and kindred lines pay a good profit and then they afford more opportunity for amplification. Every Hardware store sells Pocket Knives, and it is easy to add, say, a few Revolvers, silver Match Safes, Manicure Sets, &c. Table Cutlery also forms a good basis for building up a stock of fine goods that pays well. The common steel Knives and Forks and German silver Spoons must be carried, and naturally lead to better goods of the same kind and to other articles of necessity or luxury—Fruit Knives, Sugar Shells, Orange Spoons, Butter Knives, Butter Spreaders, Salad Forks, Salt Spoons, Pie Knives, Nut Picks and Cracks, Carvers of all kinds and degrees of excellence, case goods, oxidized, satin, bright and gilt goods in patterns and styles without number.

Silver Ware.

A good many of the Hardware merchants are adding such goods a little at a time and building up a salable line of flat Silver Ware, and people are growing to look to the Hardware stores for such goods rather than to the jewelers who had this trade to themselves. It will pay you to familiarize yourself

with the Table Ware and fine Cutlery your jewellers carry and the prices they get, and then get figures from your jobber on similar goods, and note the margin. A little money judiciously invested will give you a line, with a few cases for display purposes, and you will find that the people who come to you to buy their kitchen furniture will also buy their table Silver Ware. Having such goods will bring persons to you to buy presents for weddings, birthdays and Christmas, and will, through a natural association of ideas on the part of the public, give you a reputation for handling fine household goods. Besides, you are keeping up with the times, and that is quite important to do just now.

A Reliable System for Securing the Correct Charging of All Goods Sold on Credit.

BY B. H. ROSE.

THE LITTLE *bona fide* evidence which from time to time comes to the surface in one's business demonstrates the fact beyond any

question. If you call your salesman's attention to this matter his answer as a rule is, Oh, I'm so careful I never forget to make all charges. Now follow this particular clerk closely and I am not in the least reluctant in saying I could catch him in two days making the very error he was so sure he would not.

Delivered and not Charged.

I used to find that a great many goods in my business were delivered and not charged, in this way: When the proprietors of the different mills and factories would bring in their pass books to be written up for a 30, 60 or 90 day settlement, in putting down each day's items (checking from my ledger) I would find first one item of, say, 10 cents, then another of 40 cents, then a keg of Nails, \$1.75, and usually in two months would find the several clerks in my employ had delivered these goods, taken pass book and entered the same, while at the same time they were having a good chat on something

a sale was made, either cash or credit, it must be entered in this check book, each check being numbered in numerical order. At first one or two sales would be cash, and the entry would be put in check book, tearing out duplicate check and sending it to the office with the cash. The next sale would be a bill of Hardware to a regular builder or some other party, the order being taken down on regular city order book. As soon as finished the salesman would turn to his check book under head of sale No. 3, and make an entry on check as follows:

Making Entries.

"Mdse. sale, \$27.00. John Jones" (this being made in duplicate the same as a cash sale, the only difference being he would not tear out the check, but let it remain in the book). When the day's business was over each salesman would pass his check book into the office to the bookkeeper, who would foot up the cash sales, which were kept in one column, and then check up the credit sales

SALESMAN No. 2
 FROM: Jan 1st
 TO: Jan 20th
1893.

JONES-BROWN & Co..
 DAYTON.
 OHIO.

TOTAL CASH. \$450.⁷⁸
 CREDIT. \$936.⁸² Book
 A-1.

Front Cover.

On Cash			
a1		a1	
<u>1.25</u>		<u>1.25</u>	
a2		a2	
<u>75</u>		<u>1.25</u>	
a3		a3	
<u>John Jones</u>		<u>John Jones</u>	
<u>\$27.00</u>	27 00	<u>\$27.00</u>	
a4		a4	
<u>450</u>		<u>450</u>	
Total	27 00	650	

Salesman's Check Book.

Sample Page.

doubt that there must be a very great omission on the part of most every salesman to charge all goods he delivers to customers on credit. He may be the head clerk and a very busy man, a man capable of handling one or more customers at the same time, and for this particular reason he might be more apt to omit making the proper entry simply because when the first sale was made, in order to wait upon the second customer whom he had already started with he will say to himself: I'll charge Mr. Blank with the goods when there is a little let up. In this way from one customer to another he goes through the day's business, forgetting one, and how many more? You tell. I can't. Clerks in different kinds of business and proprietors as well do the same thing and the leakage is far beyond one's real comprehension if he does not stop and meditate very carefully on this one important

that occurred the previous evening, as clerks get well acquainted with men who buy regularly for mills and factories, hence they naturally like to spin out a little chat, forgetting how easy it is to omit the charge and disobeying the rule I gave them—viz.: *Never put an item on pass book prior to charging it on our regular blotter.*

A Preventive.

In order to overcome this carelessness I originated a plan which acted as a great preventive, as very few omissions to charge goods were discovered afterward. First I numbered each salesman, including myself, from No. 1 to 8. I then gave each one a duplicate check book, the cover and a sample page of which are shown herewith, with positive instructions that he must keep this check book on his person all the time and not lay it around in different parts of the store; and whenever

from his journal to see if they compared with the checks left in the different salesmen's check books; in this way the ground was so thoroughly gone over it was a difficult matter to make an error, and in order to prevent any delays in the next day's business each salesman could have a duplicate set of check books, so the bookkeeper could retain those of the preceding day and properly complete his work in the way of filling in the amounts on the credit checks and bring down the grand total of both cash and credit sales each day.

When all the checks in a book are used, the total cash and credit sales are entered upon the front cover in blank spaces reserved for this purpose.

Premium for Sales.

At the end of each month I had my bookkeeper present the salesman who made the best showing in the way of

total amount of sales, \$5. This seems a small amount, but it was of such interest to each man that they all worked hard to secure the same and by this means my business showed a decided increase and scarcely ever was my notice called to any goods not being charged, as each salesman wanted to make a good record for himself and was on the alert to enter on his check book every sale he made, either cash or credit, so it could be proved by the cashier or bookkeeper. I observed each man's sales gradually increased, so that the plan adopted acted in two ways, as it prevented goods going out of the store without being charged, and increased my sales, which was, of course, very profitable. Have a place set aside to keep these check books so you can refer to them, and when this system is in operation if you will insist on the rule being followed the results—that is, the increase in your business—will more than pay you double for the little trouble and expense which it will cost.

Organize some method to prevent leakages or you will never understand where the profits of your business go to. The plan I have described is a very simple one, as the checks can be of ordinary perforated paper so they can be removed easily.

Lamps and Lamp Goods.

IN VIEW of the largely increased attention which the Hardware trade are giving to the sale of Lamps the following advices in regard to recent developments in this line will be of interest to our readers. It is evident that constant progress is being made in the production of attractive and artistic Lamps with fine illuminating power and at moderate cost.

Meriden Bronze Company, 30 Park place, New York, manufacturers of Lamps and art goods, have brought out a number of admirable designs and finishes in their various departments for this season's trade, and they direct attention to the demand this year for metal goods in genuine gold plate, the color and finish of which will remain good for years. They have an Oriental finish, enamel on metal, either brass, copper or composition, which is hardly distinguishable from porcelain, while it is practically free from injury or breakage in shipping or handling. Another attraction is a Royal finish. The metal base is etched with acid, the recesses being plated with silver and the balance of the surface with gold. Moss green and terra cotta effects on metal are also produced closely resembling genuine terra cotta, together with novelties in white and gold, French *cloisonné*, and Venetian wrought iron work and flower ornamentation. The finishes described above are applied to Banquet, Piano, Table, Hall and Library Lamps. Some very handsome onyx tables are shown in higher grades, with but little metal

work. In gas fixtures the tendency seems to be toward more graceful and delicate patterns, rather than the heavier and inartistic types. Some very attractive designs are shown finished in white and gold.

Edward Miller & Co., 10-12 College place, New York, have on exhibition in their spacious showrooms a large number of Banquet Lamps, many of the patterns and designs having been made for this season's trade. Some attractive goods will be found in Roman bronze and Royal and gold finish, the latter being intended to harmonize with interior trimmings and furniture of the Louis XV period. There are some excellent effects in onyx and gold and silver finish. High French globes instead of shades seem to be coming into fashion again. They have a number of these in amber, pink, and representations of ice and fish scales. A new line of Boudoir Lamps in all the above finishes are ready, together with some recent patterns of wrought iron Boudoir and Banquet Lamps. In art goods they are offering a number of solid cast brass Tables, with decorated china tops, harmonizing with white and gold work. In chiffon Shades the variety is very large, many being handsomely embroidered by hand and made on forms new this fall.

The American Lamp & Brass Company, Trenton, N. J., and 44 Park place, New York, have just issued an elegant catalogue of their Lamps, containing 41 leaves, each 17 x 10½ inches, held together by silk cord passed through eyelet holes at the back. The cover is handsomely embossed in tints of blue and white and represents a classical female figure holding a complete Lamp in the uplifted right hand. The plates are in color on heavy paper, three illustrations being shown on each leaf in *fac-simile* as to color, design, decoration, &c., leaving nothing to be imagined in this respect by the buyer. Among the Lamps shown are Table, Parlor, Vase, Dresden and Metal Tablet, Banquet, Boudoir, Library and Hall Lamps. This company are making a feature of porcelain Lamp Globes in medium and high-grade decoration after the order of Dresden and other porcelains. These globes are suited for imported Dresden china Banquet and Vase Lamps. This concern are especially well equipped for this class of goods, as porcelain decoration is an important feature of their business.

Wallace & Sons, 27 Chambers street, New York, manufacturers of Lamps, &c., have just issued supplementary catalogue No. 8 of Onyx Tables, Pedestals, Cabinets and Jardinière Stands, covering 44 pages, fully illustrated. A number of finishes can be supplied to order in connection with the goods described, among which are gold plate, gold lacquer, antique brass and bright and oxidized silver. Upward of 100 patterns of Tables alone, with or without Lamps, can be seen in their

New York showrooms. In Banquet, Library, Boudoir, Hall and other Lamps, together with novelties in art goods, an interesting variety is presented. Some of the prevailing finishes are barbetine, maroon and gold and onyx and gold. There are a number of rococo patterns, one prominent example being a large figure of Cupid holding a lamp font. In Boudoir Lamps varieties may be seen in filagree work and other designs finished in pink, blue, ivory, maroon, black and combinations of gold and silver.

Antique Powder Horn.

THE ACCOMPANYING ILLUSTRATION represents what is referred to by the present owner, as a stag horn Gunpowder Flask, master piece, made in the fifteenth



Antique Engraved Powder Horn.

century by Arabs and presented to the Prince of ancient Syracuse, on the eastern coast of Sicily. The entire surface was first polished and then handsomely engraved with mythological figures, evidently designed to commemorate some feast or festival where offerings and sacrifices of fruit, wine, rams, &c., were made. The entire length over all is 14¾ inches, the surface being of an ivory color, the engraved portions of which are filled with some black substance. The mouth-piece is of ebony or some similar wood, while the rings by which to suspend it are of iron, in a fair state of preservation. We are indebted for the loan of this interesting Powder Horn to Henry C. Squires, 20 Cortlandt street, New York, dealer in Arms, Ammunition, &c., in whose possession it is temporarily.

Arrangement of Stores.

ROLOSON BROS.

ROLOSON BROS., 1900-1910 Frederick avenue and 1525 West Baltimore street, Baltimore, Md., carry a line of Agricultural Imple-

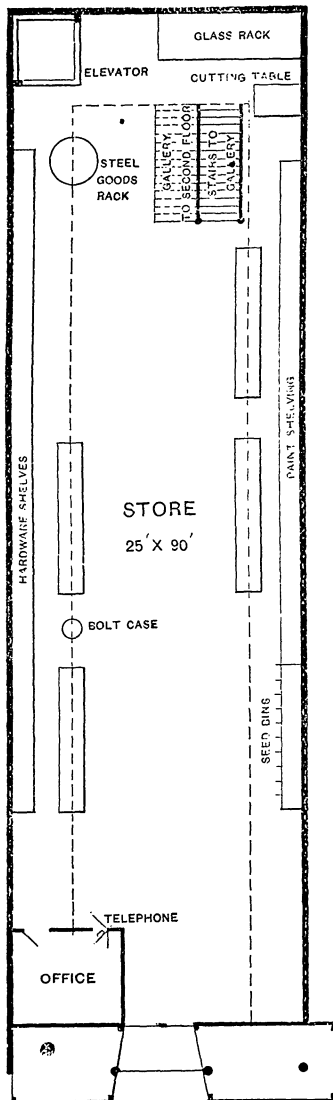


Fig. 859.—First Floor Plan.

ments, Fertilizers, Garden and Field Seeds, Farm Wagons and Carts, Carriages and Road Carts, and Hardware. The arrangement of the first floor of

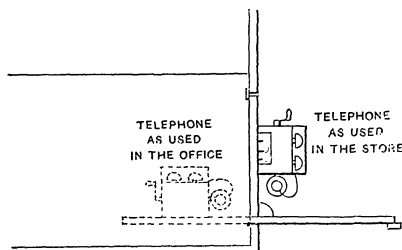


Fig. 860.—Arrangement of Telephone.

their main store, which is 25 x 90 feet, is shown in Fig. 859. The building is a two-story brick, standing on the corner, with excellent show window facilities, which are used to advantage. The office is at the left of the entrance and is two stories high, the upper por-

tion being reached from gallery. A novel arrangement of the telephone is shown in Fig. 860, which allows of its use either in or out of the office. The 'phone is attached to a small door composed of two pieces at right angles to each other. Thus the opening is always closed when the instrument is in use, and by this arrangement the book-keeper can use the telephone without leaving his desk in the office, or it can

has windows on all sides, having been recently built, and arranged with particular reference to this line of business.

Trade Items.

C. M. AVERY has been appointed as the direct representative of the Horton Mfg. Company, Fort Wayne, Ind. The company manufacture Washing Machines in a variety

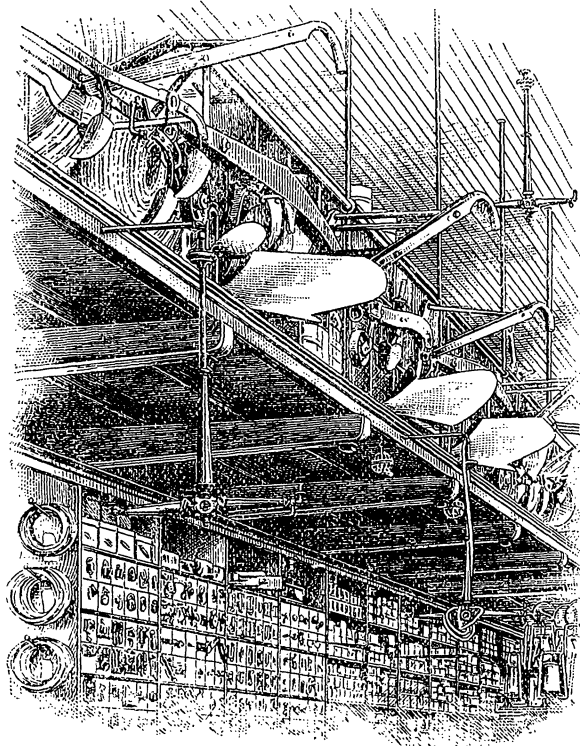


Fig. 861.—Gallery.

be used from the store without entering the office. The dotted lines on the floor plan represent the gallery, which runs around three sides of the store, the arrangement of which is shown in Fig. 861. The gallery is 5 feet wide, with a railing to which are fastened samples of Plows, Cultivators, &c. There are 30 bins on the gallery along one side of the store, the bins being 2 feet wide, 2 feet deep and from 3 feet 8 inches to 8 feet high. These are used for Forks, Shovels, Spades, Steel Rakes, &c., as shown in Fig. 862. Bins are dispensed with on the gallery at the other side of the store, but on that side Refrigerators, Butter Boxes, Churns, Poultry Netting, &c., are kept. Stairs at the back of the store lead to the gallery and to the second story. An elevator runs to the gallery and to the second story, the latter being used as a display room for Harvesting Machinery, Binders, Mowers, Horse Rakes, Tedders, Grain Drills, Harrows, Plows, Wagons, Carts, Carriages, Fans, Corn Shellers, Cutting Boxes, &c. Samples of Farm Bells are arranged on the gallery at the head of the stairs, as shown in Fig. 863. The basement is used as a general store room, being perfectly dry with a good floor. Nails, Plows, Plow Castings, Wheelbarrows, Harrows, &c., are kept there. The store is well lighted and

of styles, also Corn Planters, and have, we are advised, largely increased the facilities of their already well equipped plant. The Western Combination Washer is referred to as a new special machine at a very reasonable price.

W. W. FERRY, with **C. W. Dunlap**, 88 Chambers street, New York, has been made sales agent of the Avery Stamping Company, Cleveland, Ohio,

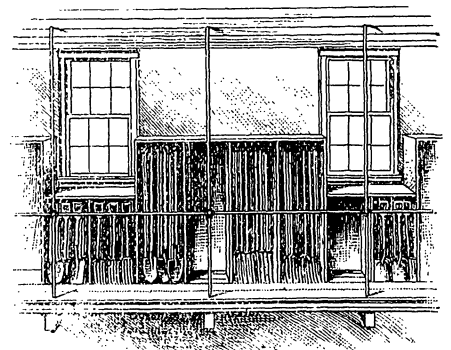


Fig. 862.—Bins on Gallery.

for the New England States, New York, New Jersey and the cities of Philadelphia, Baltimore and Washington. A sales office has been established at the above address.

PENINSULAR METAL WORKS, Detroit, Mich., are manufacturing the Peninsular All-Round Shovels, one of which is illustrated in their advertisement on another page. The larger sizes of

these Shovels are referred to as being well adapted to snow and barn use. The lighter Shovels are, we are advised, especially attracting the attention of furnacemen who are desirous of securing a light, shapely and cheap shovel for use in connection with furnaces, while at the same time it is a good all-round Shovel.

GILLETTE CLIPPING MACHINE COMPANY, 201 East Twenty-third street, New York City, are getting out a series of show or display cards, 11 x 14 inches in size, with illustrations 7 x 10 inches, showing various Clippers in operation, either hand or power, on colored pasteboard. Cuts show interior of stable, with boy turning machine and operator

they illustrate their Pump Leathers and Fiber Axle Washers. These Leathers are referred to as made from a fine grade of oak tanned leather in three sizes, 3, 3½ and 4 inches in diameter.

THE B. & O. TRIPLE PUNCH, a description of which was given in our last issue, as put on the market by Butts & Ordway, 502 Atlantic avenue, Boston, is sold to the trade at a price which enables them to retail at \$25.

BUHL STAMPING COMPANY, Detroit, Mich., in their advertisement on another page call attention to their line of Lanterns and Tubular Headlights, the latter being illustrated. They state that every Lantern is tested be-

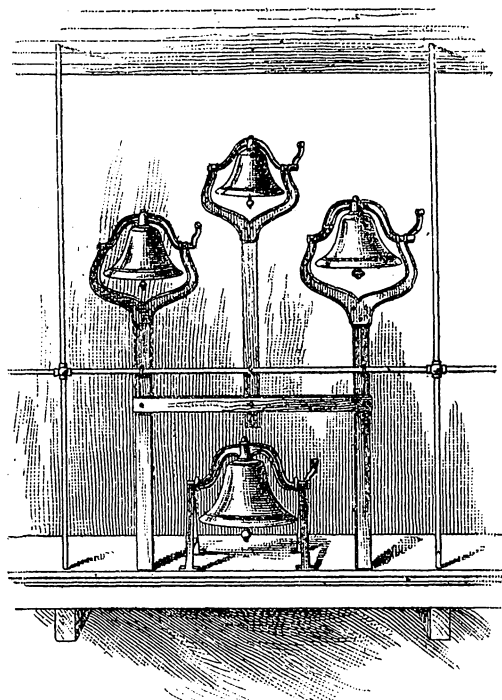


Fig. 863.—Samples of Farm Bells.

using Clipper. The various machines are Featherweight, Bicycle or Power, either water, electric or steam. These cards have name and address of operator and such matter as he designates. The cards are suitable for display in stables, blacksmith shops, hotels, on fences, &c. They are sold at \$5 per 100. Business cards, ordinary size, of a similar character will be printed according to order and furnished at \$5 per thousand or \$3.50 for 500. The Gillette Company are preparing a sample sheet of the four large cuts, all showing different Clippers in operation with different surroundings, to be sent out to order from.

AMONG the Special Notices this week is one in which a manufacturing company, having a salesman on the road selling Mechanics' and Machinists' Tools, announce that they are desirous of making an arrangement with another concern by which their goods will be represented by the same salesman, the two companies to share expenses. The advertisers are well-known and representative manufacturers.

V. A. MOORE of Atlanta, Ga., has engaged with E. C. Stearns & Co., Syracuse, N. Y., to represent their Hardware line throughout the Southern States. Mr. Moore will also look after the interests of the Standard Tool Company of Cleveland, Ohio, in the same territory.

OUR READERS will observe the advertisement of Detroit Valve & Washer Company, Detroit, Mich., in which

fore it leaves the factory and that construction and quality are guaranteed.

Wells & Nellegar Co.'s New Catalogue.

WELLS & NELLEGAR COMPANY, jobbers of Hardware, Cutlery, Guns, Tinners' Stock and Metals, 72 to 76 Lake street, Chicago, have just issued their new catalogue, on which they have been diligently working for some little time. The issuing of this catalogue is an event in the history of this house, it being their first, but the work has been so well done that it would be extremely creditable to any one. This is a comparatively young house. It was started under the style of Wells & Nellegar some 16 years since, at 150 Lake street, occupying two floors. In 1883 they found that their rapidly increasing business called for a much larger store, and accordingly removed to the old stand of Brintnal, Lamb & Co., which they still occupy. In 1887 they bought out the extensive Hardware stock of Keith, Benham & Dezen-dorf, at that time very prominent Chicago Hardware jobbers, whose business was thus largely incorporated with their own, bringing increased prestige. The early training of the heads of the various departments of the Wells & Nellegar Company was gained from the Miller Bros., for many years very prominently identified with

the wholesale Hardware trade of Chicago, as Robert M. Wells, John B. Nellegar, James H. Paterson, Philip R. Woodford and Joseph B. Bettles were all associated with them.

The Wells & Nellegar Company have from the first aimed to build up a business on the quality of their goods. Their success is attributed in no small degree to this principle. The catalogue now issued is substantial evidence on this point. It comprises 1160 pages, beautifully printed, handsomely illustrated and strongly bound in half morocco, arranged to lie flat when opened at any place. It begins with Carpenters' and Woodmen's Tools, in which are included related lines. Next follow Tools of a miscellaneous character and Farm and Garden Tools. Builders' Hardware then takes up a great deal of space. Horse Furniture and Wheelwrights' Supplies are next in order. After these come House Furnishing Goods in great variety. Cutlery is an important section, which naturally runs into Table Ware. Guns and Sporting Goods take up considerable space. Oil Cans and Stove Furniture come next. A large section is devoted to Pieced and Stamped, Granite, Blue Enameled and Aluminum Ware, with Kitchen Utensils. The closing pages are taken up with Tinners' Stock and Tools. Not only is the arrangement of the contents very convenient for reference, owing to the method employed, but extreme care has been taken with the illustrations so as to present them in a way pleasing to the eye rather than to economize space. Those who receive these catalogues are specially favored by having their names stamped on the back in gilt letters, which is a graceful compliment that will no doubt be highly appreciated by the recipients.

Export Notes.

A. M. GRUNDY of Opp & Grundy, exporters, 15 Whitehall street, New York, who left here early in July for London, opened a temporary office and sample room at 28 Fenchurch street, for the exhibition of samples of American manufactures. After arranging for a permanent representation elsewhere in London, he sailed for Cape Town, South Africa, September 28. On arrival he will establish a branch house at Cape Town with suitable accommodation for displaying samples in the interest of the concerns represented by them. A year will be devoted to traveling the colonies thoroughly and permanently establishing the business, when he will visit Australia to supervise the trade already inaugurated in Sydney and Melbourne. Mr. Grundy has spent some years in Australia already in the various colonies soliciting orders for American houses.

Peoli & Willey, 97 Chamber's street, New York, are dealers in Cutlery, Hardware specialties and machinists' fine Tools. They represent the following concerns for export: Swedish Razor Company, Charles J. Manss, R. W. Rogers Company, Hatch Cutlery Company, and Benj. F. Badger Strap Company. On some of the above noted lines they also solicit domestic trade. Both members of the concern were formerly with the Electric Cutlery Company.

Phoenix Lock Works' Catalogue.

PHENIX LOCK WORKS, Newark, N. J., with New York office at 103 Chambers street, M. C. Hanton, have issued a large sized illustrated catalogue of 159 pages, bound in stiff

cloth covers. Illustrations are shown of a line of Mortise Store Door Locks and Handles, Door Knockers, Front Door Sets, Mortise and Rim Locks, Escutcheons and Roses, Night Latches, Sliding Door Locks, Ship Hardware, Drawer Pulls, Coat and Hat Hooks, Electric Push Buttons, Hinges, Chain Door Fast, Trunk and Deed Box Locks, Keys and Blanks, Striking Plates, &c. The catalogue is provided with an alphabetically arranged index, a numerical index of Locks and Latches, Bell Pulls, Coat and Hat Hooks, Door Knobs and Escutcheons. Tables arranged according to numbers give information relating to Front Door Sets, Mortise Front Door Locks and Vestibule Latches in sets, &c., in a most explicit manner. The book is well arranged, handsomely printed, and is calculated to be of service to the trade.

Prison Labor.

A GOOD DEAL of attention at the present time is being directed to the question of the employment of prison labor in the manufacture of goods which enter into competition with those made by free labor. The injurious effects of this practice are pointed out, as prison labor is furnished at a price which is exceedingly low and in many cases may be termed nominal, and the result is that manufacturers are compelled to reduce their wages in a corresponding manner, or, when this cannot be done, to abandon the manufacture of such goods altogether. There has thus been caused a great deal of injury both to the manufacturer and to the workman.

To prevent this condition of things some of the States have laws which prevent the employment of prison labor in competition with free labor, and others in one way or another have legislated, or are considering legislation, to minimize the evil as much as possible. Thus, for example, in the States of Ohio, Massachusetts, New York and others it is provided by law that the number of inmates in all of the penal institutions of the State employed at any one branch of labor shall not exceed 5 per cent. of the total number of persons in the same State employed in the same kind of labor. The matter has recently been carefully considered in the Constitutional Convention of the State of New York, and among the proposed amendments of the Constitution is one which bears directly upon this problem:

The legislature shall by law provide for the occupation and employment of prisoners sentenced to the several State prisons, penitentiaries, jails and reformatories in the State, and on and after January 1, in the year 1897, no person in such prisons, penitentiaries, jails or reformatories shall be required or allowed to work while under sentence thereto at any trade, industry or occupation wherein or whereby his work or the product or profit of his work shall be farmed out, contracted, given or sold to any person, firm, association or corporation.

This section shall not be construed to prevent the legislature from providing that convicts may work for, and that the products of their labor may be disposed of to the State or any political division thereof, or for or to any public institution owned or man-

aged and controlled by the State, or any political division thereof.

The above proposed amendment recognizes, it will be seen, the desirability, or necessity almost, of giving employment to the prisoners and attempts to leave room for work which will occupy their time and keep them from the evil effects of absolute idleness, while at the same time guarding manufacturing interests from the demoralization and injury which would be caused if the products of prison labor were put on the market.

As discussing this question in a practical and forcible way and illustrating the effects of competition with prison made goods, the following letter from the Stuart-Peterson Company, Burlington, N. J., manufacturers of Hollow Ware, will be of interest:

Our goods are made in prisons at Auburn, N. Y., Baltimore, Md., Columbus, Ohio, and Jeffersonville, Ind. We understand that Sing Sing, N. Y., will soon engage in a new line also. In regard to the effects of the same we will state that one hollow ware company in Philadelphia has gone out of existence on account of the prison octopus, and that we left Philadelphia in order, under reduced expenses, to cope with this great evil. No better evidence of the terrible effects of this conspiracy to wrest the bread and butter from the mouths of the families of honest labor can be found than that in a letter we have received from a Savannah, Ga., company, in which they refused to pay our bill because we charged them a reasonable per cent. over wages paid free labor, but which made the goods nearly double that of prison labor. This means we must either force our men from between \$2 and \$3 per day down to 40 cents in order to compete or quit the line. We cannot do the latter, pay forty cents, and thus must add one more item to the long list of goods we have ceased to make because we cannot compete.

Another article this year has been forced down to such an extent that to compete we must lay \$1 worth down in New York for 79 cents. It is not the tariff—with all off we would still be under English prices—but it is the State farming out prison labor at 40 cents per day, and furnishing the plant, and asking us to pay taxes virtually to shut our own doors. Honest men go hungry that the politician contractor may wax fat, and if you were to scratch the back of some men in high places we know of, you would find "prison deal" under the skin. We can cite the case of a very large concern with all of the modern appliances, but who, despairing of competing with prison labor, now buy their goods of the prisons, block them over to change appearances, and sell them as their own make, thus wresting the work from their own workmen and adding prosperity to the prison contractor. How long this will continue, or how long the wheels of toil outside the prisons will continue to turn, we cannot say. The Republican party promises protection to its voters, but in the direct need it forgets the prison and its baneful influence on honest labor. The Democratic party promises emancipation from the convict system, but aside from a feeble attempt at righting the wrong, the procession moves on as of old.

The laboring man strikes for higher wages from employers (already burdened with non-dividend paying plants), but forgets to help said employer at the polls by forcing this issue and thus securing higher wages by bettering his condition. In proof of

this Hon. John O'Neill of Missouri, author of the pending bill in Congress to regulate prison labor, says: "It is a crying shame that the protests come from the manufacturing interests, not the laboring classes. The latter admit the evil, know that their families suffer, yet seem to feel that their influence is too small to have any effect. Thus what is everybody's business is nobody's, and the evil goes on apace."

Paddock-Hawley Iron Company's Catalogue.

PADDOCK-HAWLEY IRON COMPANY, St. Louis, Mo., have issued an 1895 catalogue of 798 pages, bound in leather and cloth. A full page illustration at the front of the book represents their building on the corner of Tenth and Spruce streets, which is complete in all departments and contains over 3 acres of storage space. The stock is divided into five departments, as follows: Iron, Heavy Hardware, Blacksmiths' and Horse-shoers' Supplies, Carriage and Coach Trimmings and Wagon and Carriage Wood Work. In addition to their building a warehouse is used on track in East St. Louis, where is carried surplus stock of Wagon Wood, Heavy Iron and Rails. They also have additional yards for Wagon Lumber of all kinds. A classification index indicates the location of various lines of goods in the catalogue, as follows:

Iron and Steel, pages 1-11.
Miscellaneous goods, 11-34.
Horseshoes, Nails and Toe Calks, 35-50.
Blacksmith, Farrier and Wood-Workers' Tools, 51-231.
Wagon Hardware, &c., 232-270.
Bolts, Nuts, Screws, &c., 272-298.
Wagon and Carriage Wood Work, 299-412.
Axles, Springs and Carriage Hardware, 413-518.
Carriage and Coach Mountings and Trimmings, 519-664.
Varnishes, Paints, &c., 665-680.
Malleable Irons, all kinds, 680-781.

The remaining pages are devoted to goods too late for classification, estimated shipping weights of goods and useful information. Following the classification index is an alphabetically arranged index. The catalogue is fully illustrated with descriptions and list prices, while the make-up and general arrangement of the book indicate that the customers' convenience has been thoroughly considered and provided for.

Sidney Shepard & Co.'s Catalogue.

SIDNEY SHEPARD & CO., Buffalo, N. Y., issue catalogue and price-list No. 58, illustrating and describing the goods manufactured and sold by them. The book when closed measures 8½ x 11 inches, and contains 236 pages bound in flexible cloth covers. Full page views of the company's Buffalo and Chicago offices and warerooms, also of factories A and B, occupy positions at the front of the book, and are followed by an alphabetically arranged index. The goods are arranged in departments, as follows: Pages 13 to 92 include the company's manufactures; pages 93 to 221 are devoted to outside goods for which they are agents and other goods which are also carried in stock, and pages 222 to 236 give lists of goods which the company can ship direct from the points of manufacture. The book is well

printed on a good quality of paper and blank ruled pages are interleaved at convenient distances apart for making memoranda of new goods, prices, &c. The company have recently added to their manufactures a line of Kitchen Ware made from pure aluminum. They now supply and have in preparation the following goods, which are made in all the regular sizes: Dish, Bread, Fry and Jelly Cake Pans, Tubed Cake and Muffin Pans, Coffee Pots, Milk and Dripping Pans, Pie Plates, Perfection Tins, Mountain Cake Pans, Dippers, Corn Cake Pans, Tea Steepers and Tea Kettles. The other lines of goods illustrated are Stamped Ware, Pieced Tinware, Polished and Retinned Pieced Tinware, Japanned Ware, Toilet Ware, Water Coolers, Galvanized Ware, Coal Vases, Elbows, Baking Pans, Oil Tanks, Milk Cans and Can Stock, Freezers, Tin Plate, Galvanized Iron, Metals and Tinners' Supplies, Granite and American Blue and White Enameled Steelware, Kitchen Utensils, Tinners' Machines and Tools, &c.

Marshall-Wells Hardware Company's Catalogue.

MARSHALL-WELLS HARDWARE COMPANY, Duluth, Minn., have issued a large illustrated catalogue of 1094 pages, handsomely bound in leather and cloth. A full page view of the store and warehouse on Fifth avenue, west, is given at the front of the book and is followed by an alphabetically arranged index. The lines of goods listed in the catalogue include Mechanics' and Edge Tools, Builders' and Miscellaneous Hardware, Iron Roofing, Building Papers, Felt, &c., Pipe Fittings and Brass Goods, Saws, Belting, Hose, Packings and Mill Supplies, Wire Rope, Cordage and Ship Chandlery, Iron, Steel and metals, Contractors', Mining and Lumbermen's Supplies, Heavy Harness, Strap Work and Blankets, Glass, Paints, Oils, Varnishes and Brushes, Stoves, Tinware and House Furnishing Goods, Wire Fencing, Farming Tools, &c., Blacksmiths' and Butchers' Tools and Supplies, Cutlery, Razors. Shears and Plated Ware, Guns, Ammunition, Tents and Fishing Tackle, Tinners' Stock and Tools. The company remark that their shipping facilities are not equaled by those of any other point for reaching Minnesota, Northern Wisconsin, upper peninsula of Michigan, the Dakotas, Montana and the far Western States. The book will be welcomed by the trade for which is designed and is an indication of the enterprise and progressiveness of the newer portion of the West, as it compares favorably in arrangement, paper, typographical work, binding and in the variety and the completeness of the lines of goods illustrated with catalogues issued by larger and older concerns in the long established trade centers of the country.

Electrical Window Turntable.

IN THE FRONT WINDOW of an electrical supply house in this city, at 114 Liberty street, may be seen a novel arrangement for attracting the attention of pedestrians to many of the various articles made by this house, the Holtzer Cabot Electric Company, Boston and New York. It consists of a round mahogany table, about 20 inches in diameter, operated underneath by a

$\frac{1}{8}$ horse-power Class M 00 motor. At four points on the edge, equidistant, are incandescent electric lamps fixed rigidly to the table, and so arranged that each burns about one-quarter of a revolution as it comes to the front. The lamps together with the moving table are for the purpose of arresting attention. On the table are distributed a number of goods for inspection. If desired colored lamps can be used instead of the plain crystal. The mechanism is all underneath, while on the spindle supporting the table is fitted an extra pulley, to which other turntables up to six may be belted if desired.

Price-Lists, Circulars, &c.

THE HORTON MFG. COMPANY, Fort Wayne, Ind.: Washing Machines and Corn Planters. An 1895 catalogue and price-list shows the Western Combination Washer, Western Washer, American Washer, Wayne Round Washer and the metal bottom Western Washer, also the Superb and American Corn Planters. Their special Machine, the Western Combination Washer, is referred to as being sold at a very reasonable price and as having been received in the market with gratifying favor.

ST. ALBANS FOUNDRY COMPANY, St. Albans, Vt.: Railway Horse-Powers, Threshing Machines, Fodder and Sugar Cane Shredders, Circular and Drag Saw Machines, &c. A catalogue relating to their agricultural department illustrates the foregoing, with descriptions. The company state that they have recently made material alterations and improvements in their line of new Tread Power Machines, in the direction of simplifying and strengthening working parts.

AMERICAN WIRE GOODS COMPANY, Lowell, Mass.: Wire Coat and Hat Hooks, Screw Hooks, &c. A pamphlet is devoted to illustrations and prices of the B. B. Wire Coat and Hat Hooks, which are referred to as having broad bearings—on both branches, broad backs, and a brace between both branches. Another price-list relates to Bright Iron Wire Goods for use in cotton and woolen mills and by loom-harness makers.

SWEETPERETTE COMPANY, Grand Rapids, Mich.: Sweeperette Carpet Sweepers. Among other advertising matter published by the company is an illustrated pamphlet devoted to the evolution of the Carpet Sweeper, and explaining the points of excellence embodied in the Sweeperette. Price-lists and circulars accompany the pamphlet.

THE DAVID MAYDOLE HAMMER COMPANY, Norwich, Chenango County, N. Y.: Solid crucible cast steel Hammers. An illustrated catalogue and price-list shows a large number of new styles of Hammers, as well as those already known to the trade. The manufacturers remark that the same high standard of work which has for 50 years characterized these goods will be maintained on Hammers bearing their old trade-mark. On different pages throughout the catalogue are given illustrations of some of the awards made to Maydole Hammers by different expositions.

RUMSEY MFG. COMPANY, Detroit, Mich.: Youth's Companion and Coaster Sleds. Illustrations and descriptions of these goods are given, which are made of soft steel tubing manufactured for this purpose. The goods are referred to as many times superior to the ordinary Sled, safely supporting 1000 pounds, and as being in weight not above ordinary Wooden Sleds of corresponding size.

KING HARDWARE COMPANY, Atlanta, Ga.: Stoves, Hardware, &c. The company send to their trade cards measuring 11 x 14 inches, announcing the time at which their traveling men may be expected. The card illustrates seasonable goods.

GREY IRON CASTING COMPANY, Mount Joy, Pa.: Hardware, Iron Novelities and House Furnishing Specialties. A catalogue of 98 pages illustrates and describes lines of Shutter Hinges, Thumb Latches, Chest Handles, Pincers, Amateur Vises, Sad Irons and Stands, Shelf Brackets, Match Safes, Hatchets, Hammers, Coat and Hat Hooks, Jail Padlocks, &c. Particular attention is directed to their Toy Sad Iron with detachable handle. The company have recently enlarged their plant, and are, they remark, better equipped for good work and prompt shipments than ever before.

SHELTON COMPANY, Birmingham, Conn.: Zinc Glaziers' Points. A folder illustrates Derby and Boston Standard Glaziers' Points in both triangle and sharps, each in six sizes. The Points are put up in 100-pound bulk kegs, 25-pound bulk boxes, and in $\frac{1}{4}$ and $\frac{1}{2}$ pound papers.

SHEBLE & KLEMM, Fairmount Fork Works, Frankford, Philadelphia: Farm and Garden Tools, &c. A revised price list for 1894-95 illustrates Manure and Spading Forks, Potato Hooks, Hay Forks, Sluice, Oyster and Turnip or Beet Forks, Coal and Coke and Stone or Ballast Forks, Manure Drags, Steel Ice Hooks, Steel Garden, Ballast and Asphalt Rakes, Malleable Garden Rakes, Cast Steel Weeder, &c. Attention is called to their Patent Locked Forks and Hooks, in which the manner of bridling or locking the tines in the handle prevents them from becoming loose, and also takes the strain off the shank, and centers the strength where it is most needed.

COLUMBUS WIRE AND IRON WORKS, Southcomb & Howe, Columbus, Ohio: Wire and Iron Work. An illustrated catalogue and price-list is devoted to Wire, Window Guards, Office Railing, Farm, Lawn and Front Fencing, Iron Stall Guards, Spark Guards, Hat Racks, Flower Stands, Hitching Posts, Trellises and Ornamental Garden Work.

It Is Reported—

Arkansas.

That Redwine & Phipps are successors of J. C. Phipps in the Hardware business, at MAYNARD.

California.

That the Hardware stock of the J. G. Burt estate at, SAN BERNARDINO, has been purchased of the executors by Wilcox & Rose of COLTON.

Colorado.

That the Hardware store of J. F. Roth, MONUMENT, was broken into by burglars on the 15th inst., who carried off about \$600 worth of goods.

Georgia.

That the building occupied by the Hoyt Hardware Company, BRUNSWICK, was burned out on the 19th inst. The stock was valued at \$20,000. Insurance is estimated at \$9250.

That the Fitten-Thompson Hardware Company, ATLANTA, have opened a new Hardware store on the corner of Broad and Marietta streets.

Illinois.

That the safe of the Hardware firm of Cahill & Thelan, LADD, was blown open recently and \$300 and a number of valuable papers taken.

That the town of LATHAM was almost wiped out by fire on October 18. Among the stores destroyed was that of William G. E. Pope, Hardware

dealer. Mr. Pope's loss is estimated at \$3000.

That Davis & King are a new Hardware and Tin firm at ELGIN.

That burglars early on the morning of October 17 smashed in the front window of W. A. Boynton's Hardware store at TURNER and carried off all the Knives, Revolvers and Razors in the showcases.

That Heirons & Acklane have succeeded V. Francis in the Hardware and Implement business at CAMP POINT.

That Franzen & Miller are successors of H. H. Franzen at GOLDEN.

Indiana.

That J. R. Butt of KNOXVILLE, TENN., has purchased John Frith's Hardware store at ELWOOD.

That Haxtun & Miller's Hardware store at LYONS was destroyed by fire on October 10. Loss, \$5500; insurance, \$2000.

That burglars effected an entrance into Shirk & Miller's Hardware store at PERU on the night of October 10, and secured a large quantity of Knives and Revolvers.

That George Maurer's store at ELKHART was robbed on October 13.

That Moore Bros. are a new Hardware firm at LAKEVILLE.

Iowa.

That L. M. Sturtevant will open a new Hardware store at NEWTON about November 1.

That the Hardware store of A. C. Newell, at WOODWARD, was burglarized on the 6th inst. Seventy-five dollars in cash and a number of Knives and Razors were taken.

That Messrs. Early and Wilson have purchased the R. B. Crose stock of Hardware, Stoves, &c., at SHENANDOAH.

That Grant Stafford has sold his interest in the Hardware business, at MORNING SUN, to H. Cavin.

That George Evanson is laying the foundation for his new Hardware store at CALLENDER, which will be 22 by 60 feet.

That J. C. Granfield, Hardware, &c., MACKSBURG, recently suffered loss by fire.

That Adams Bros. and W. H. Huntington, Hardware dealers, at MANCHESTER, have consolidated their stocks and will continue business under the style of Huntington & Adams.

Kansas.

That fire recently visited the store of C. H. Monroe, at NESS CITY.

That George Metz, in the Hardware business at HURON, has sold out.

That Thompson & Baker, Hardware merchants, TORONTO, have dissolved.

That E. A. Rea has bought out the Hardware stock of Nathan Roberts at KINSLEY.

That the O'Neil Hardware & Implement Company, WAUKOMIS, OKLA., have removed to AXTELL.

Maine.

That the Hardware store of E. A. Weatherford, LINCOLN, was entered a short time since and Rifles and Revolvers carried off valued at \$200. This makes the fourth time that the store has been the victim of thieves.

That Turney & Wingate, dealers in Stoves, &c., HOULTON, have dissolved partnership.

Massachusetts.

That C. S. Lovejoy, stove dealer, NEWBURYPORT, was damaged by fire on the 16th inst.

That S. A. Brock has sold out his Hardware and Stove business at MALDEN to Charles P. Dearborn and G. G. Greenwood, who will continue it under the style of Dearborn & Greenwood.

Minnesota.

That burglars entered the Hardware store of Bean & Guderian, ANOKA, on the 16th inst., and got away with a

quantity of Revolvers, Shotguns and Knives.

That C. A. Roy is building a new Hardware store at LE ROY.

That O. A. Anderburg, OSTRANDER, has completed his new store building.

That T. H. Bjoin, Hardware merchant, CROOKSTON, has been succeeded by the Bjoin Hardware Company.

Missouri.

That the Hardware store of J. T. Jamison at GOWER was broken into on the 8th inst. and a large number of Pocket Knives, Spoons, Rifles, &c., stolen. A reward of \$25 has been offered for the apprehension of the thieves.

That W. J. Flynn has disposed of his Hardware business at ST. JOSEPH and engaged with the Simmons Hardware Company of ST. LOUIS. Mr. Flynn will represent the company in Wisconsin, with headquarters at MILWAUKEE.

That the Bascom Hardware Company is the style of a new concern at NEVADA.

New York.

That the Hardware store of Edward Lindquest, 45 Hamilton avenue, BROOKLYN, was rifled by thieves on the 19th inst.

Ohio.

That burglars entered the Hardware store of John Kane, CALDWELL, on the 11th inst., and secured a number of Knives and Revolvers, besides \$20 in cash.

That W. A. Fillmore, ZANESVILLE, will remove his Hardware business to new quarters about the first of 1895.

Pennsylvania.

That Finch & Co.'s Hardware store at BETHLEHEM was burned out on the 15th inst.

Rhode Island.

That S. M. Clarke's store at CENTERVILLE was slightly damaged by fire on the 9th inst.

That Hill & Birtwell, Stoves, &c., EAST PROVIDENCE, have been succeeded by Arthur E. Hill.

South Dakota.

That the WATERTOWN Hardware firm of Heegaard & Co., consisting of A. M. Heegaard and M. A. Heegaard, were dissolved on the 3d inst. The business will be continued by M. A. Heegaard, who is authorized to collect all accounts and settle all bills of the former firm.

Texas.

That the Western Hardware Company, HOUSTON, have recently purchased the Hardware stock of T. W. Smith.

Wisconsin.

That Max Von Syburg has purchased the Hardware stock of Burder & Co., MILWAUKEE.

That Mr. Morrison of DE KALB, ILL., has purchased a Hardware stock, at OAKFIELD.

That H. C. Norris's Hardware store, at ELKHORN, was robbed on the 13th inst.; \$75 worth of Pocket Cutlery, Razors, Shears, &c., were taken.

That James Short & Son, Hardware, Implements, &c., OAKFIELD, have dissolved.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—Sharp competition for orders for dry White Lead is still the most conspicuous feature of the mar-

ket. In this the rivalry between old process and new process manufacturers in the interior is particularly conspicuous, each being bent upon securing orders for product deliverable during the next two months, but rivalry is not tame nearer at home. Orders are sought at 4¼¢, and it is an open secret that some have been taken at ¼¢ less, with regular trade discount. Lead in Oil is nearly as unsettled. Stock that is not in popular favor has been sold at, and a fraction under, 5¢, and as list prices 5¼¢ @ 5½¢ seem to be full high for the best American brands. Foreign makes are coming forward in somewhat liberal way and sell at various prices. The fanciest go at about 6¼¢ @ 7¢ and the ordinary brands have found some buyers at 5½¢, landed here. Taken as a whole it may properly be termed a buyers' market.

Red Lead.—Dealings in both foreign and domestic have been on a rather small scale. Competition is such that large buyers venture no further than to order as their immediate future wants dictate. Foreign manufacturers meet American prices where desirable orders may be involved and the market shows weak tone.

Litharge.—New business has been moderate and buyers take hold cautiously despite the fact that very low prices are made in some instances. The inferior grades employed chiefly outside of the Paint trade are particularly weak, with 4¼¢ @ 4½¢ common quotations and bids of 4¢ solicited for some foreign brands for future shipment. High grade is also somewhat irregular in price, but it is doubtful if round lots could be secured at under 5½¢. Holders ask 5¼¢, upward.

Orange Mineral.—No movement of other than ordinary jobbing lots has taken place and the market is still somewhat unsettled, with prices more in buyers' favor than otherwise. The nominal price for French is 8¼¢, but at that rate it has few buyers alongside of German at 6¼¢ and English at 6¼¢. There is very little doing in domestic, the net prices for which are about 6¼¢ @ 6½¢, as to size of order.

Zincs.—Orders for American Oxide come in slowly and are almost invariably for rather small lots. Manufacturers quote the old list prices, but that concessions would be made to secure particularly desirable orders is morally certain. In short, the market is rather weak. German may be secured in round lots at 4¼¢, possibly at less. Prices for French have been marked down, but the cost is still too high for anything in the way of liberal business.

Colors, &c.—No line of Dry Colors has met with anything more than very ordinary jobbing movement. There being no incentive to anticipating future wants except on very conservative lines, buyers are going slow. Where specially low prices may be named some buying against future wants is done, but prices low enough seem to be few and far between. Oil Colors and ready mixed Paints do not meet with particularly satisfactory sale, although the general outturn is doubtless well up to the average for the season.

Miscellaneous.—There has been no change in the market for Block Chalk, Whiting or Putty. Business goes along in about the usual way at old prices. Clays in general have found fair sale and prices are rather soft, although sellers repeat former quotations.

Oils and Turpentine.

Linseed Oil.—City crushers have advanced their prices to 56¢ for raw and 59¢ for boiled Oil, the same figures applying to product of both American

and foreign seed. The advance is due chiefly to high cost of raw material, but there are evidences of more harmony among producers generally, with a view to getting prices as high as possible without opening the market up to European product. Business has been very fair but large buyers are now more careful since they have considerable stock under contract that was purchased previous to the last advance.

Cotton Seed Oils.—In this line prices have averaged lower. The prime depressing influence was the apathy of buyers. Next to that was influence of the well established fact that grinders will have all the raw material they can handle. In other words, the prospect for a heavy output of Oil this season is the governing feature. Crude is down to the basis of 25¢ for prime. Summer Yellow may easily be secured at 30¢ here for prime, and other varieties at corresponding prices.

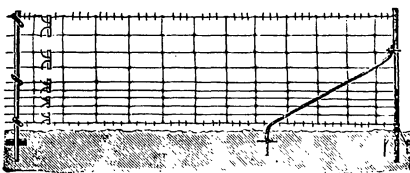
Lard Oil.—Lard Oil has been selling in a limited way at prices on the basis of 61¢ @ 62¢ for prime, present make. Bids have been solicited of much less money for round lots, and the response was very feeble, indicating upon the whole a weak market for wholesale quantities.

Fish Oils.—Nothing in the way of new developments in the market for crude Sperm, Whale or Menhaden Oils has transpired, and prices stand just about as they were a week ago. Jobbing trade in the pressed and bleached Oils has improved somewhat, but not sufficiently to change prices for the better.

Spirits Turpentine.—The Southern clique that made one failure of trying to run a "bull" market have resumed the head of the caravan, and are not backward in endeavoring to create the impression that they have the reins well in hand this time. No Northern buyers have purchased liberally on the strength of this information, but enough business has been done to carry prices up to 28½¢ for regular and 29¢ for machine barrels.

The Mast Woven Wire Fence.

An illustration is herewith presented of a special fence which has just been put on the market by the Northwestern



The Mast Woven Wire Fence.

Barb Wire Company of Sterling, Ill. It is made of galvanized wire with iron posts. Several objects have been kept in view by the inventor and manufacturers, as follows: To form a tight fence secure against the pressure of all kinds of domestic animals; to accomplish rigidity and tension, and to meet the wishes of those who desire a strong but cheap fence. The fence is made of single galvanized wire, except the top and bottom strands, which are of barbed wire. These are crossed with wire 1 foot apart. The wires are tightened with a patent spring tightener, which extends over every two wires, as shown in the cut, and is operated by an ordinary monkey wrench. These tighteners are applied every 20 rods. The post is a flat bar of iron driven in the ground edgewise against the wires, with an anchor of sufficient size attached below the surface to keep the

post firmly in place. The fencing is put up in rolls of various lengths and with a varying number of wires, according to the use for which it is intended. The company state that it is already meeting with great success.

Hammer Wedges.

Sawyer Hardware & Supply Company, Pawtucket, R. I., are manufacturing a line of malleable iron hammer wedges, to the quality of which they refer. There are six sizes, and the wedges are provided with a flange head to cover the rough end of the handle. The wedges are put up two dozen in a box, each size packed separately.

Pneumatic Rubber Sporting Boat.

The American Rubber Boat Company, 487 Broadway, New York, are introducing the Layman Pneumatic Sporting Boat for shooting and fishing, as illustrated in Figs. 1, 2 and 3. It is of an irregular oval shape, broadest at the back and made of high grade cotton cloth and rubber gum, in a better manner, it is remarked than even footballs. There are four circular compartments or air chambers in the boat, each with an independent valve through which to inflate, which it is said can be done in two to five minutes. If as many as three compartments were punctured at one time the fourth, it is explained, will keep a man afloat. The boats are made in two sizes, suitable for adults or children. The adult size can be had either as made in Fig. 1, or with full length legs for wading or walking about. In the latter case adjustable fins or paddles are fitted to the boots for propulsion. One can wade with the regular pattern, Fig. 1, but not so conveniently for long distances. The boat is propelled by folding paddles or fins on the boot legs, which close or feather with the forward motion of the leg and open with the backward stroke. A rudder is hinged at the back and so arranged that it may be made stationary when in use by means of a strap and buckle. When afloat the occupant is in a natural and easy sitting position, the surrounding water affording a perfect cushion. Air cushions or seats are furnished, if wanted. The arms and body of the occupant are free for the use of rod, gun or any purpose, and in

boat with rubber storm cape, which is fastened snugly under the breakwater by a cord. This is to protect the sportsman from rain or rough waters. While speed is not a factor, 2 to 3 miles an

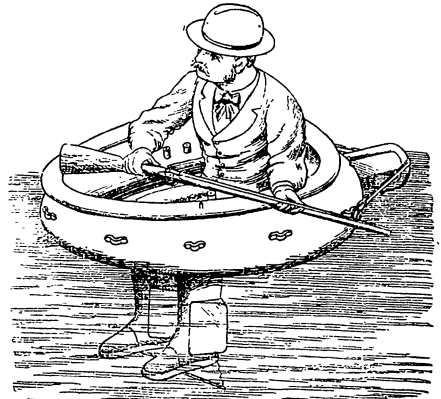


Fig. 1.—Boat without Storm Cape.

hour is said to be a gait attainable with little practice, and exceeds the swimming record. The adult size of boat weighs 15 pounds, and with the air

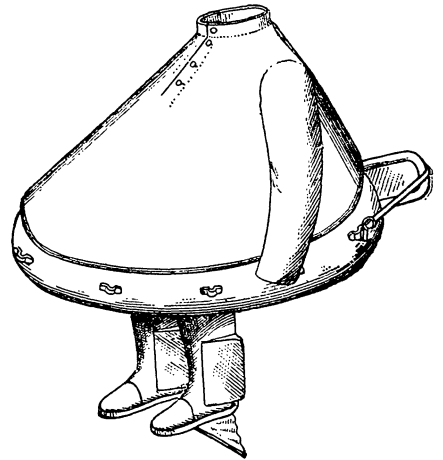


Fig. 2.—Boat with Storm Cape.

exhausted can be folded and packed in a valise. In yachting it can be used to get to or from large boats in deep water, without a tender, and as a life preserver can quickly be made ready



Fig. 3.—Boat with Blind.

moving about there is no noise or splash whatever. The loops seen on the gunwales of the boat are for holding reeds, grass or brush as a blind, as shown in Fig. 3. Fig. 2 represents the

for use. It has been found impossible to sink it with a man in the boat and full of water, while an adult, with three children, whose combined weight was 300 pounds, was easily carried.

Reversible Towel Rails.

Robert Ferguson, 51 Mercer street, New York, sole manufacturer for the patentee, is introducing the reversible towel rail as shown by the ac-

bath is box shaped, with removable water pan and rollers of solid white rubber. The bath is made of galvanized iron, and the boxes in which the roller axles run are of composition metal, to prevent rust stains on the cloths. The bath is well finished and

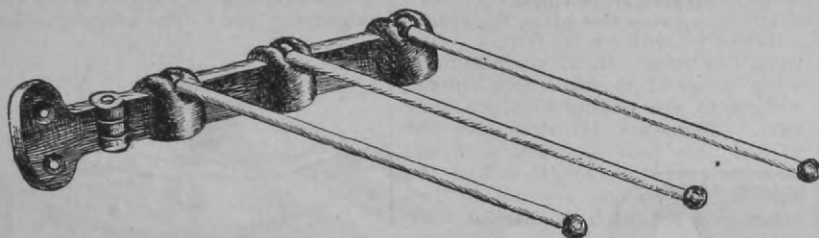


Fig. 1.—Hinged Towel Rails.

companying illustrations. This device consists of three polished and lacquered brass arms, 12 inches long, held by nickeled balls on both ends in a nickeled hinged bracket $6\frac{1}{2}$ inches extreme length. The bracket is alike on both sides and can be screwed to the front or back of a washstand on either right or left side, or can be attached to



Fig. 2.—Washstand with Racks in Position.

door or window jambs, or other wood work. When not in use the arms can be lifted upright and allowed to drop, hanging perpendicularly, or in use all or part can extend to the front or rear, whichever is most convenient. Fig. 1 shows the bracket with sockets alike on both sides. Fig. 2 shows the racks in and out of use on a washstand. In lots of five gross sizes from 7 to 14 inches can be furnished to order at the same

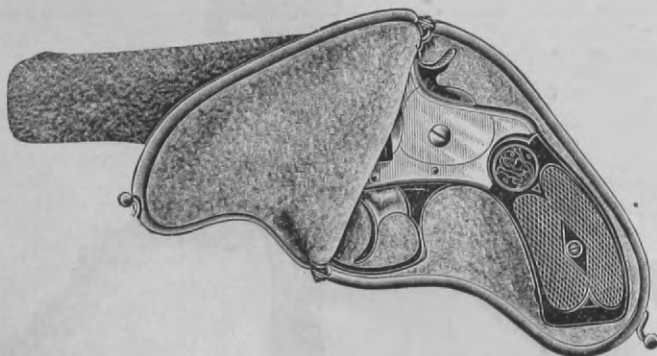
nicely striped, while the width of the rollers obviate the necessity of folding the cloths.

Electric Motors.

The Taylor Battery Company, 51 Dey street, New York, are manufacturing the Taylor Motor, for small power uses, of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, 1 and 2 horse power. The $\frac{1}{2}$ horse power motor they recommend for installation in 15 foot, 75-pound cedar boats, especially for trolling or cruising purposes, and it is not intended to furnish high speed. The motor is coupled direct to the propeller shaft, involving no loss of power in gearing down. This size is run by ten-cell batteries, and is called the multipolar type. The current can be thrown from the upper to the lower brush, reversing the motor instantly. The $\frac{1}{4}$ horse-power motor, it is stated, can be wound so that ten standard cells will run a 15-foot boat 5 miles an hour for ten hours; or so wound that 16 cells will propel the boat 7 miles an hour for 20 hours. The cost of running is put at 4 cents per hour, and cells can be recharged without removal from boat, while a 2-gallon jug will carry sufficient fluid for recharging 16 cells. These motors are also suitable for running sewing machines, lathes and a number of purposes, according to horse-power.

Buckskin Revolver Pockets.

Hartley & Graham, 313-315 Broadway, New York, are offering the buck-



Buckskin Chamois Lined Revolver Pocket.

price. The smaller sizes can be used as clothes racks.

Perfection Roller Blotter Bath.

The Cincinnati Tool Company, Cincinnati, Ohio, are manufacturing the Perfection Roller Blotter Bath, for use in copying correspondence, &c. The

skin chamois lined revolver pocket, here illustrated. The pocket has a nickeled brass rim, firmly closed over the edge of the leather, hinged at the center, with a ball friction catch at the end, which is quickly unfastened by a dexterous twist of the thumb and finger, or can be left unclasped when quick use of the revolver is anticipated. The point is made that the pocket is flexible

and compact in form and fitted to the lines of the pistol, that it is not cumbersome and that it keeps the fire arm clean and free from dust and dirt, as well as rust from perspiration. There are two sizes and several lengths of barrels, as follows: No. 1, 0.32 caliber, 3 and $3\frac{1}{2}$ -inch barrel; No. 2, 0.38 caliber, $3\frac{1}{2}$, 4 and 5 inch barrel. The pockets are adapted to Smith & Wesson, Forehand, Harrington & Richardson, Iver Johnson and other automatic revolvers.

McGill's Drapery Hooks.

Holmes, Booth & Haydens, 37 Park Place, New York, are offering drapery hooks as herewith illustrated. In Fig. 1 is given a sectional or side view of the fleur-de-lis hook showing its construction, also a front view of it. The hook has a single prong and is designed for hanging curtains, portières and other drapery. In use the hook proper is passed through the folds of

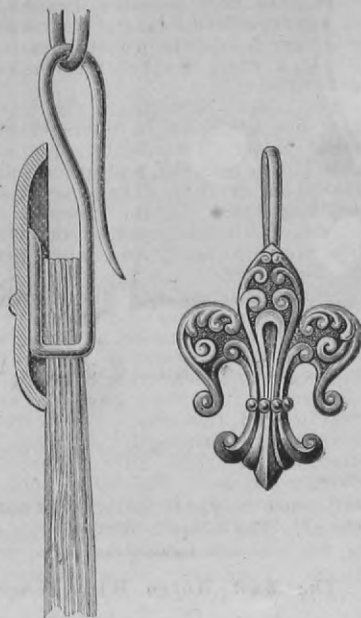


Fig. 1.—Fleur-de-lis Drapery Hook.

the drapery in such a manner as to cause the material to ride in its saddle, the hook then being hung in the eye of the pole ring, as shown in the sectional cut. In Fig. 2 is a representation of a button drapery hook with two prongs and two

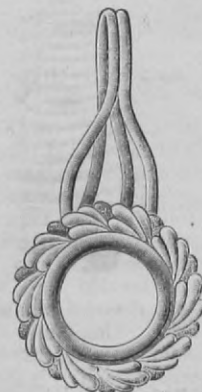


Fig. 2.—Button Drapery Hook.

drapery supporting saddles, adapting the hooks to support extra heavy draperies. The button center is open, exposing the material of the drapery through it. Another style button is made solid covered with leather, and this form can also be had covered in any material and color.

Bommer's Compound Spiral Spring Hinges.

Bommer Brothers, 351-353 Jay street, Brooklyn, N. Y., have recently put on the market new styles of compound spring hinges, as here shown. The hinge No. 501, shown in Fig. 1, is 4 inches long and measures 5 inches in width over all. It is made in bronze

sent a single action box flange hinge, No. 605, which is made only to order. It is made of the same material and in the same finishes as the 501 and 502 already described, and in 4, 5 and 6 inch lengths. The hinge is designed for use on water closets having marble jambs, and is furnished complete with headless bolts threaded at each end, having fancy ball tipped nuts for both ends. In ordering this hinge the exact

closed; that they give a more even action, and that if one spring breaks the usefulness of the hinge is not destroyed.

Berlin Christmas Tree Holder.

Logan & Strobbridge Iron Company, New Brighton, Pa., are offering the Christmas tree holder shown in the accompanying cut. The manufacturers

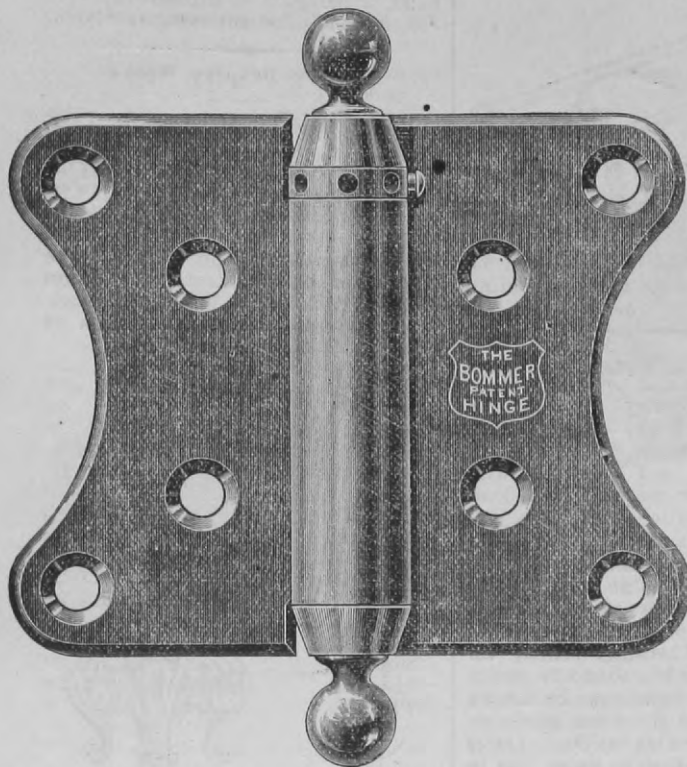


Fig. 1.—The Bommer Surface Hinge No. 501.

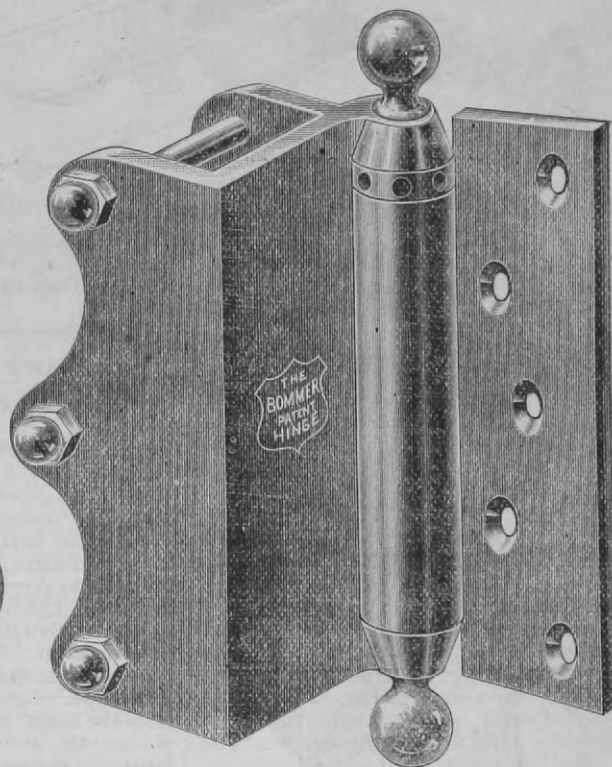


Fig. 2.—The Bommer Single Action Box Flange Hinge No. 605.

and brass only, full polished or nickel plated. The hinge is designed for use on water closets having marble or wood jambs. For marble jambs countersunk screws with nuts are provided. When so ordered this hinge is furnished with reverse action, to keep the door open instead of closed. This necessitates the

thickness of the marble must be stated. The same hinge is made in double action, and is known as No. 633. Fig. 3, in which two of the springs are cut away, shows the construction of the compound spiral springs used in the hinges, of which springs there are from two to four in each hinge, according to size and strength. The size of the wire of each spring is smaller than that of the one surrounding it. The advantages claimed for this construction are: that

refer to the holder as being handsome and unique, strong, substantial and neat in design. It is made with three sizes of holders which fit on the same feet—1½, 2½ and 3 inches in diameter. The set screw which fastens the tree has a range of ¾ inch. The holders are finished in dark green and are packed one dozen in a case, assorted sizes.

BUFFALO SPECIALTY COMPANY, Buffalo, N. Y., are packing an X. C. Plate

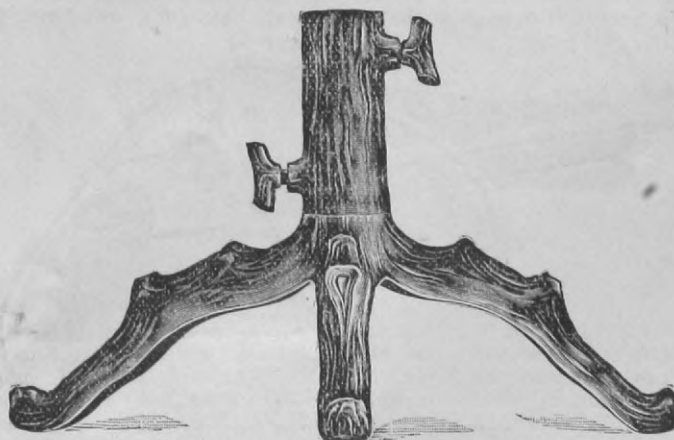


Fig. 3.—The Bommer Compound Spiral Spring.

door being fastened on the inside when closed. The hinge is also made in a No. 502, which is the same in all particulars as the one described except the flanges, which are narrow for marble and wide for wood. The point is made that in these hinges the flanges are attached to the cylinder their entire length, resulting in much strength where needed. In Fig. 2 is repre-

more power is gained, and in a shorter length, than with one heavy spring; that the springs are more elastic and flexible than a single spring of the same strength; that more power is exerted by the springs when the door is nearly

Malleable Bridle Bit with every 25-cent box of Rapid Harness Menders. They state that every Bit is guaranteed first-class in every respect, and is alone worth 25 cents. This is done to introduce and advertise their Harness



Berlin Christmas Tree Holder.

Menders more thoroughly. The menders are put up in tin boxes, packed in display cases of one, two or three dozen each.

Sweeperettes.

A new line of carpet sweepers is now being put on the market by the Sweeperette Company, Grand Rapids, Mich.,

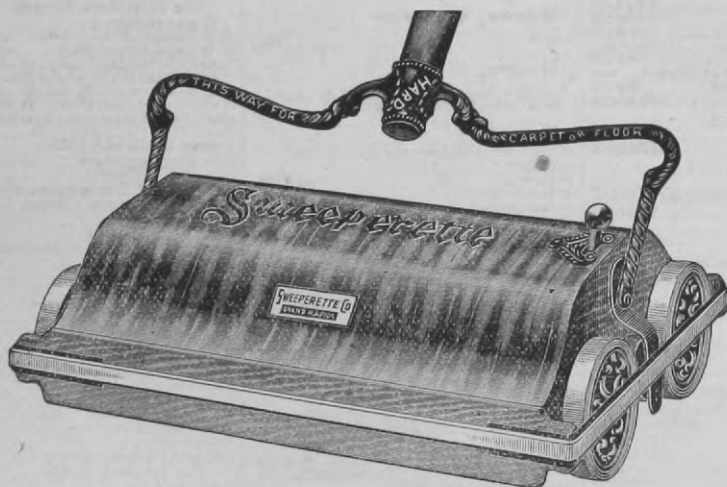
will not drop down at the corners so as to catch in the carpet. The manufacturers state that the brush is made of selected hog bristles, and they call attention to the fact that it is held in the sweeper in the most effective and simple manner. Braid designed to harmonize with the wood used in the box is put on for a furniture guard. This is secured in place and



Fig. 1.—Sweeperette No. 4.

and 76 Fifth avenue, New York. Two patterns are shown in the accompanying illustrations. That shown in Fig. 1 is made of selected birch with a light cherry finish, while the design of the box is referred to as presenting an artistic appearance. Fig. 2 shows a sweeperette with genuine mahogany veneer finely finished throughout. The castings, wheels, bail and all parts exposed to the eye are well finished and nickel plated. The interior construction and the material used are the same in all the various styles of sweeperettes.

has advantages, the makers consider, over rubber or other material for the purpose. The bail is of an effective and distinctive design, while with it an adjustment of the brush is secured. On one side of the bail in raised letters is the following: "This way for a hard carpet or floor," and on the other side of the bail is: "This way for a soft carpet." The sweeper is to be used in the usual position, with the reading toward the operator, giving directions for the kind of surface upon which the sweeperette is used at the time. There



Sweeperette No. 6.

The handle is fastened in the socket by a flat strip of steel with an offset, which springs over the lower inside portion of the socket, holding the handle rigidly in place. The handle can be placed in the socket or taken from it in a moment and without trouble. The pans are dumped one at a time by moving the metal ball at the top of the sweeperette forward or back, emptying the pans at a single dump, and without liability of spilling the dirt on the floor. The pans are doubled at the corners to insure strength, and so adjusted, it is remarked, that they work readily and

is an ingenious arrangement which automatically raises the brush when it is to be used on a soft carpet, and lowers it for use on a hard carpet or floor. This adjustment, it is explained, avoids the necessity of pressing the sweeper down and thus exhausting the operator's strength and tiring the back. The manufacturers claim that the sweeperette will sweep under a bed, table or chair, or will sweep a tile or marble floor, a feature which is peculiar to the sweeperette, and that the goods are made of the best materials and in the best possible manner.

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Current Hardware Prices.

OCTOBER 24, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price; thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Adjusters, Blind—

Domestic..... $\frac{1}{2}$ doz \$3.00, 33% $\frac{1}{2}$ doz \$4.10
 Excelsior..... $\frac{1}{2}$ doz \$10.00.....50 & 10 & 2%
 North's..... $\frac{1}{2}$ doz \$10.00.....1st net @ 10%
 Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, etc.

Anvils—

American—

Eagle Anvils, $\frac{1}{2}$ doz \$9.....15 & 16 & 5%
 Horse shoe brand, Wrought.....3% @ 10%
 Barnes Mfg. Co.....50%

Imported—

Armstrong Mouse Hole.....3% @ 9%
 S. & H., machine finished.....9% @ 10%
 Trenton.....9% @ 10%
 Peter Wright's.....9% @ 10%

Anvil Vise and Drill—

Allen Anvil and Vise \$3.00.....40 & 10%
 Cheney Anvil and Vise.....25%
 Millers Falls Co., \$18.00.....20%
 Holt's.....40 & 10 & 10%

Apple Parers—See Parers Apple, etc.

Augers and Bits—

Boring Machine Augers.....70 & 70 & 10%
 Car Bits, 12-in. twist.....60%
 Common Augers and Bits.....70 & 70 & 10%
 Cincinnati Bell-Hangers' Bits.....40%
 Forster Pat. Auger Bits.....25%
 Jennings' Pattern Car Bits.....40%
 Jennings' Pattern Auger Bits.....60%
 O. E. Jennings & Co., No. 10, extension lip.....40%
 O. E. Jennings & Co., No. 30.....60%
 O. E. Jennings & Co., Auger Bits, $\frac{1}{2}$ set.....60%
 32% quaters, No. 5, \$5; No. 30, \$3.50, 25%
 Russell Jennings' Augers and Bits 25 & 10%
 Lewis' Patent Single twist.....45%
 L'Hommedieu Car Bits.....15 & 10%
 Pugh's Black.....20%
 Pugh's Jennings Pattern.....30%
 Snell's Bits.....60 & 5 & 10 & 10%

Bit Stock Drills—

Cleveland.....50 & 10 & 5%
 Cincinnati, for wood.....40 & 10 & 10%
 Cincinnati, for metal.....50 & 10 & 10%
 Morse Twist Drills.....50 & 10 & 5%
 New Process Twist Drill Co.....50 & 10 & 5%
 Standard.....50 & 10 & 5%
 Syracuse, for metal.....50 & 10 & 5%
 Syracuse, for wood (wood bit) 50 & 10 & 40%

Expansive Bits—

Clark's small, \$18; large, \$28.....40 & 10 & 5%
 Ives' No. 4, $\frac{1}{2}$ doz \$80.....40 & 10 & 10%
 Stearns, No. 1, \$26; No. 2, \$18.....40 & 10 & 5%
 Stearns' No. 2, \$48.....20%
 Swan's.....40 & 10 & 10%

Gimlet Bits—

See.....25 & 25 & 10%
 Common..... $\frac{1}{2}$ doz \$2.50 & \$3.00
 Diamond..... $\frac{1}{2}$ doz \$1.25.....40 & 10%
 Double Cut:
 Hartwell's..... $\frac{1}{2}$ doz \$10.00.....40 & 10%
 Douglass.....40 & 10 & 10%
 Ives.....60 & 10 & 10%
 Shephardson's.....45 & 10 & 10% & 10 & 5%

Hollow Augers—

Bonney's Adjustable, $\frac{1}{2}$ doz.....\$21.00
 Cincinnati Adjustable.....25 & 10%
 Cincinnati Adjustable.....25 & 10%
 Douglass.....33% & 33% & 10%
 French, Swift & Co. (Beecher).....33% & 33% & 10%
 Ives'.....33% & 33% & 10%
 Ives' Expansive, each \$4.50.....20 & 10%
 Stearns'.....20 & 10%
 Universal Expansive, each \$4.50.....20%
 Wood's, $\frac{1}{2}$ doz, \$48.....25 & 10%

Ship Augers and Bits—

L'Hommedieu's.....15 & 10 & 15 & 10 & 5%
 Snell's.....25 & 25 & 10%
 Snell's Ship Auger Pat'n Car Bits.....15 & 10 & 15 & 10 & 5%
 Watrous'.....25 & 25 & 10%

Awl Hafts—See Hafts, Awl.

Awls—

Brad, Handled..... $\frac{1}{2}$ gr. \$2.50 @ \$3.00
 Brad, Shoulders..... $\frac{1}{2}$ gr. \$1.30 @ \$1.40
 Peg, Pat..... $\frac{1}{2}$ gr. 35 & 38 & 8%
 Peg, Shoulders..... $\frac{1}{2}$ gr. \$1.50 @ \$1.55
 Scratch, Handled..... $\frac{1}{2}$ gr. \$1.00 @ \$1.50
 Scratch, Socket..... $\frac{1}{2}$ doz. \$1.10 @ \$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands.....\$6.00 @ \$6.50
 First quality, other brands.....5.50 @ 6.00
 Beveled add 50% $\frac{1}{2}$ doz.

Axle Grease—See Grease, Axle.

Axles—

No. 1 Common.....3% @ 3% $\frac{1}{2}$
 No. 2 Common.....4% @ 4% $\frac{1}{2}$
 Nos. 7 to 14.....7%
 Nos. 15 to 18.....4% $\frac{1}{2}$
 Nos. 19 to 22.....7%
 Concord, loose collar.....4% @ 4%
 Concord, solid collar.....6% @ 6% $\frac{1}{2}$

Bag Holders—See Holders, Bag.

Balances—

Caldwell, low list.....30%
 Pullman.....60%
 Sensible.....60%

Spring—

Spring Balances.....40 & 10 & 50%
 No. 2000 20 30
 Chatillon, $\frac{1}{2}$ doz.....\$0.80 0.95 1.75 net
 Chatillon Straight Balances.....40 & 10 & 10%
 Chatillon Circular Balances.....50 & 10%

Barb Wire—See Wire, Barb.

Bars—

Crow—
 Cast Steel..... $\frac{1}{2}$ doz \$24 @ \$34
 Iron, Steel Points..... $\frac{1}{2}$ doz \$24 @ \$34

Basins, Wash—

Standard Fiberglass, No. 1, 10 $\frac{1}{2}$ -in., \$1.80;
 12-inch, \$2.00; 13 $\frac{1}{2}$ -in., \$2.50.

Beams Scale—

Scale Beams, List Jan. 12, '83.....50 & 10 & 50 & 10 & 25%
 Chatillon's No. 1.....50 & 10 & 50 & 10 & 25%
 Chatillon's No. 2.....50 & 10 & 50 & 10 & 25%
 Custers.....33%

Beaters—

Egg—
 Bryant's..... $\frac{1}{2}$ gross \$14.00
 Double (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross, No. 0 \$12.00; No. 1, \$15.00; No. 2.....\$36.00
 Dover..... $\frac{1}{2}$ doz \$1.00; $\frac{1}{2}$ gross, \$10.50
 Dover, Ex. Family Size..... $\frac{1}{2}$ doz, \$3.50
 Dover (Standard Co.)..... $\frac{1}{2}$ doz \$1.00
 Duplex (Standard Co.)..... $\frac{1}{2}$ doz \$1.00
 Duplex Extra Heavy (Standard Co.)..... $\frac{1}{2}$ doz, \$3.50
 Easy (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross \$12.00
 Improved Acme (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross, \$9.00
 Silver & Co..... $\frac{1}{2}$ doz \$4.50
 Spiral..... $\frac{1}{2}$ gross \$4.25 @ \$4.50
 Triple (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
 No. 2, \$2.

Bells—

Cow—
 Common Wrought.....60 & 10%
 Kentucky Durham.....210%
 Kentucky, Sargent's.....70 & 10%
 Kentucky, "Star".....20 & 10%
 Texas Star.....60 & 10 & 60%
 Western, Sargent's list.....70 & 10%

Door—

Crank, Brooks'.....50 & 10 & 2%
 Crank, Cone's.....10%
 Crank, Connel's.....20 & 10%
 Gong, Abbe's.....35% & 10%
 Gong, Barton's.....40 & 10 & 50%
 Gong, Yankes.....50 & 10%
 Lever, R. & E. Mfg. Co.'s.....50 & 10 & 2%
 Lever, Sargent's.....60 & 10%
 Lever, Taylor's Bronzed or Plated.....net
 Lever, Taylor's Japanned.....25 & 10%
 Pull, Brook's.....50 & 10 & 2%

Electric—

Bigelow & Dowse.....20 & 20 & 10%
 Wollensak's.....20 & 20 & 10%

Hand—

Extra Heavy Brass.....70%
 Light Brass.....70 & 10 & 70 & 10 & 5%
 Silver Chime.....35% & 10%
 White.....70%
 Globe Cone's Patent.....25 & 10 & 35%

Miscellaneous—

Call.....45 & 50%
 Farm Bells.....\$22.40
 Steel Alloy Church and School Bells.....60%

Bellows—

Blacksmiths'.....60 & 10 & 70%
 Hand Bellows.....50 & 50 & 10%
 Molders'.....50 & 50 & 10%

Belted, Rubber—

Common Standard.....75 & 10 & 75 & 10 & 5%
 Extra.....60 & 10 & 5 & 70%
 Standard.....70 & 10 & 75%
 N. Y. B. & P. Co., Carbon.....60 & 10 & 5%
 N. Y. B. & P. Co., Double Diamond.....60%
 N. Y. B. & P. Co., 1840 Para.....40 & 10%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Brettell Tire Upsetter, \$15.....45%
 Detroit Perfect Tire Bender 10 & 15 & 10%
 Green River Tire Benders and Upsetters.....30%
 Stoddard's Lightning Tire Upsetters.....15%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron.....50 & 10 & 60 & 10%
 Moore's Novelty, Mal. Iron.....60%
 Spivey's Steel Tackle Blocks 25 & 25 & 10%
 See also Machines, Hoisting.

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....80 & 20 @ 80 & 25%
 Genuine Eagle, Norway, list Oct. '84.....80 & 20 @ 80 & 25%
 Eagle, Norway, list Oct. '84.....80 & 20 @ 80 & 25%
 Phila. pattern, list Oct. 7, '84.....80%
 R. B. & W., old list.....70%
 Bolt Ends, list Jan. 1, 1890.....80 & 20 @ 80 & 25%
 Machine, list Jan. 1, 1890.....80 & 25%

Door and Shutter—

Cast Iron Barrel Square, &c.....75 & 10 @ 75 & 10 & 5%
 Cast Iron Chain (Sargent's list).....65 & 10 @ 65 & 10 & 5%
 Cast Iron Shutter Bolts.....75 & 10 @ 75 & 10 & 5%
 Ives' Patent Door Bolts.....60 & 10 @ 60 & 10 & 10%
 Wrought Barrel.....75 & 10 @ 80%
 Wrt B. K. Flush Common.....60 & 10 @ 60 & 10 & 10%
 Wrt's Shutter Brass Knob.....50 & 10 @ 50%
 Wrt's Shutter, Sargent's list.....65 & 70%
 Wrt's Shutter, all iron, Stanley's.....65 & 70%
 Wrought Square.....75 & 10 @ 80%
 Wrt's Sunk Flush, Sargent's list.....60 & 10%
 Wrt's Sunk Flush, Stanley's list.....60 & 10%

Stove and Plow—

Plow.....60 & 10 @ 60 & 10 & 10%
 Stove.....65 & 70 & 5%
 R. B. & W., Plow.....65%

Tire—

Common, list Feb. 28, '83.....70 & 10%
 American Screw Company.....70 & 10%
 Norway, Phila., list Oct. 16, '84.....75 & 10%
 Eagle, Phila., list Oct. 16, '84.....80 & 10%
 Bay State, list Feb. 28, '83.....70 & 10%
 Franklin Moore Co.:
 Norway, Phila., list Oct. 16, '84.....75 & 10%
 Eagle, Phila., list Oct. 16, '84.....80 & 10%
 Eclipse, list Feb. 28, '83.....70 & 10%
 Port Chester Bolt and Nut Company.....70 & 10%
 Eagle, Phila., list Feb. 28, '83.....70 & 10%
 Keystone, Philadel., list Oct. '84.....80 & 10%
 Norway, Phila., list Oct. '84.....75 & 10%
 R. B. & W., Philadel., list Oct. 16, '84.....35%

Borers, Tap—

Common and Ring.....20 & 10%
 Clark's.....33% @ 35%
 Enterprise Mfg. Co.....25%
 Ives' Tap Borers.....33% & 5%

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Letter—

Tatum's.....40

Boxes, Wagon—

Per D.....2%

Boxes, Miter.

Spilker's Excelsior, 3 in. \$7.50, 4 in. \$8.50, 5 in. \$13.00, 6 in. \$15.00.....20%

Braces—

NOTE.—Most Braces are sold at net prices.

Barber's.....50 & 10%
 Armstrong's.....50 & 5%
 Common Rail, American.....\$1.00 @ \$1.10
 Davis Patent.....60 & 10%
 Fray's Genuine Spofford's.....50 & 10 & 5%
 Fray's Nos. 70 to 120, 81 to 123, 207 to 414.....50 & 10 & 5%
 Ives' New Haven Novelty.....70 & 70 & 5%
 New Haven Hatchet.....60 & 5 & 60 & 10%
 Barber Hatchet.....60 & 5 & 60 & 10%
 Barber's.....60 & 5%
 Spofford.....60 & 5 & 60 & 10%
 P. S. & W. Co., Peck's Patent.....60%
 Rose & Johnson.....50%

Brackets—

Shelf, fancy, Sargent's list.....70 & 70 & 10%
 Other makes at a wide range of prices.
 Shelf, plain, Regular, list.....65 & 70%
 Sargent's list.....60 & 10 & 70 & 10%
 Bradley Shelf Brackets.....75%

Bright Wire Goods—See Wire.

Brollers—

Hem's Self-Inch.....9 10 9x11
 Basting, $\frac{1}{2}$ per doz.....\$4.50 5.50 6.50
 Morgan's Jokers..... $\frac{1}{2}$ doz. \$12, 50%
 Haven.....60%
 Wire Goods Co.....65 & 10%

Buckets, Well and Fire—

See Pails.

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butchers.

Butts—

Brass—

Cast Brass, Fast.....33% & 10%
 Cast Brass, Loose Joint.....33% & 10%
 Cast Brass, Tiebout's.....50%
 Wrought Brass.....80 & 10 @ 80 & 20%

Cast Iron—

Fast Joint, Broad.....60 & 10 @ 60 & 10 & 10%
 Fast Joint Narrow.....60 @ 60 & 10%

Loose Joint.....
 Loose Joint, Japanned.....
 Loose Joint, Jap. with Acorns.....
 Loose Pin, Acorns.....
 Loose Pin, Acorns, Japanned.....
 Loose Pin, Acorns, Japanned, Plated Tips.....
 Mayor's Rings.....
 Parliament Butts.....

Wrought Steel—

Fast Joint, Broad.....
 Fast Joint, Narrow.....
 Fast Joint, Lt. Narrow.....
 Inside Blind, Light.....
 Inside Blind, Regular.....
 Loose Joint, Broad.....
 Loose Pin.....
 Table Butts, Back Flaps, &c.....
 Bronzed Wrought Butts.....

Cages, Bird—

Hendryx Brass:
 3000, 5000, 1100 series.....10%
 1200 series.....40%
 200, 300, 800 and 900 series.....40 & 10 & 50%
 Hendryx Bronze:
 700, 800 series.....40 & 10 & 50%
 Hendryx Enamelled.....40 & 10 & 50%

Callipers—See Compasses.

Calks Toe—

Burke's, One Prong, Blunt.....4% @ 5%
 Burke's, One Prong, Sharp.....5% @ 6%
 Burke's, Two Prong, Blunt.....5% @ 6%
 Burke's, Two Prong, Sharp.....5% @ 6%
 Gautier, One Prong, Blunt.....5% @ 6%

Can Openers—See Openers, Can.

Cans Milk—

S. S. & Co.: 5-gal., \$3.00; 8-gal., \$4.40;
 10-gal., \$4.75 each.....40 & 10

Cans Oil—

Galvanized Blue Band, 1 gal., $\frac{1}{2}$ doz \$2.25
 Galvanized Blue Band, 5 gal., $\frac{1}{2}$ doz \$12.00
 Galvanized Blue Band, 5 gal., Faucet, $\frac{1}{2}$ doz.....\$3.75
 Glass Oil, Friend..... $\frac{1}{2}$ doz. \$3.75

Caps—Percussion—

Eley's B. B.....52 @ 55¢
 Eley's D Waterproof, Central Fire, S. S. 50
 Hicks & Goldmark's and Union Metallic Cartridge Co. 1000
 E. B. Grnd. Edge, Cent. Fire, 1-10's 47 @ 50¢
 E. B. Trimmed Edge, 1-10's.....47 @ 50¢
 F. L. Waterproof, 1-10's.....35 @ 47¢
 G. D.....27 @ 30¢
 Musket, Waterproof, 1-10's.....50 @ 55¢
 S. B. Genuine Imported.....45¢

Primers—

Berdan Primers, \$1.00.....2%
 B. L. Caps (Sturtevant Shells) \$1.00.....2%
 All other Primers, \$1.20.....2%

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges

Chalk Lines—See Lines.
Checks, Door—
 Barclay's 20%
 Unity 50%
Chisel—
Socket Framing and Firmer
 Ohio Tool Co. 75¢ to 100¢
 P. S. & W.
 Witherby
 Buck Bros. 80%
 Charles Buck. 80%
 Douglass 75¢ to 75¢ to 100%
 Merrill 60¢ to 100¢ to 100%
 L. & J. White. 30¢ to 30¢ to 50%
Tanged and Miscellaneous
 Buck Bros. 30%
 Charles Buck. 30%
 Butcher \$1.75 to \$5.00 to 2
 Spear & Jackson's \$5 to 2
 Tanged Firmers 15¢ to 10%
 L. & J. White, Tanged 15¢ to 10%
 Cold Chisels, fair quality, 1 lb 24¢ to 16¢
Chucks—
 Beach Pat. each, \$8.00 20%
 Danbury each, \$8.00, 30¢ to 25¢
 Graham Pat. 35¢ to 40%
 Morse's Adjustable, each, \$7.00, 20¢ to 25¢
 Syracuse, Bats Pat. 25%
 Dinner Patent Chucks
 Combination Lathe Chucks 40%
 Drill Chucks 40%
 Independent Lathe Chucks 40%
 Planer Chucks 20%
 Universal Lathe Chucks 40%
 Union Mfg. Co.
 Combination 40%
 Independent 40%
 Universal 40%
 Victor \$3.50, 25%
Churns
 McDermald Star Barrel Churn, each
 6 gal., \$2.60; 10 gal., \$2.75; 15 gal.,
 \$3.00; 20 gal., \$3.25.
 Tiffin Union, each, 5 gal. \$3.25; 7 gal.,
 \$3.75; 10 gal., \$4.25.
Clamps
 Adjustable, Cincinnati 25¢ to 10%
 Adjustable, Hammers 15¢ to 15¢ to 50%
 Adjustable, Stearns' 30¢ to 30% to 10%
 Barnes' Malleable Screw and Cabinet 50%
 Barnes' Machinists' Clamps 35¢ to 40%
 Cabinet, Sargent's 70¢ to 10%
 Carpenter's, Cincinnati 40% to 10%
 Carriage Makers' P. S. & W. Co. 40% to 10%
 Carriage Makers' Sargent's 75¢ to 75¢ to 50%
 Eberhard Mfg. Co. 40¢ to 40¢ to 10%
 Jethers' Clamps, Tatum's 25¢ to 10%
 R. I. Tool Co.'s Wrought Iron 25%
 Saw Clamps, see Vises, Saw Filers
 Stearns' Steel 50¢ to 75¢ to 50%
 Warner's 40¢ to 10¢ to 40¢ to 10%
Cleavers, Butchers—
 Beatty's 40¢ to 40¢ to 10%
 Bradley's 25¢ to 30%
 Foster Bros. 30%
 New Haven Edge Tool Co.'s 40%
 Nichols Bros. 30%
 P. S. & W. 35¢ to 25¢ to 35% to 10%
 Schulte, Lohoff & Co. 40¢ to 40¢ to 50%
 L. & J. White. 25%
Clips—
 Baker Axle Clips 25¢ to 10%
 Norway, Axle 10¢ to 10% to 50%
 Norway Axle, Bar Clips, 60¢ to 10¢ to 10%
 3d grade Norway Axle 70¢ to 70¢ to 10%
 Steel Felloe Clips 70¢ to 70¢ to 10%
 Superior Axle Clips 70¢ to 70¢ to 10%
 Wrought Iron Felloe Clips, 1 lb, 4¢ to 14¢
Cloth and Netting, Wire
 See Wire, etc.
Cockeyes— 50%
Cocks Brass—
 Hardware List (Globe, Kerosene, Lever
 Bibbs, Racking, etc.) 60¢ to 20¢ to 60¢ to 10%
Coffee Mills—See Mills, Coffee.
Collars Dog—
 Brass, Pope & Stevens' list 40%
 Chapman Mfg. Company, new list 40%
 Embossed, Gift, Pope & Stevens' list 30¢ to 10%
 Leather, Pope & Stevens' list 40%
 Medford Fanny Goods Co. 40¢ to 10¢ to 50%
Combs Curry Co— 35¢ to 40%
 American Curry Comb Co. 50¢ to 10¢ to 50¢ to 10% to 10%
 Gibb's Magic 20¢ to 20%
 Kohler's Humane 1¢ to 1¢ to 75%
 Kohler's Magic Oscillating 20¢ to 20%
 Rubber, per doz., \$7.50 20%
Compasses, Dividers & C.
 Compasses, Calipers, Dividers, 70¢ to 10¢ to 75%
 Bemis & Call Co.'s
 Dividers 65%
 Calipers, Call's Patent Inside 65%
 Calipers, Double 65%
 Calipers, Inside or Outside 65%
 Calipers, Wing 60%
 Compasses 50¢ to 50%
 Excelsior 50%
 Barrett's
 Combination Dividers 25%
 Lock Calipers and Dividers 25%
 Spring Calipers and Dividers 25¢ to 10%
 Stevens & Co.'s 25¢ to 10%
Coolers, Water—
 S. S. & Co.: 2-gal., \$3.40; 3-gal., \$4.00;
 4-gal., \$4.50; 5-gal., \$5.00 each 80%
Coopers Tools—
 See Tools, Coopers.
Cord Sash—
 Braided, Crown, Drab and Fancy, 1 lb
 55¢ 80%
 Braided, Crown White, 1 lb, 50¢ 50%
 Cable Laid Italian Sash 1 lb, 20¢ to 20%
 Common 1 lb, 8¢ to 8¢ to 40%
 Common Russia Sash 1 lb, 12¢ to 12%
 Egyptian, India Hemp, Braided 20%
 India Cable Laid Sash 1 lb, 15¢ to 15%
 Massachusetts, White 21¢ to 21%
 Osawa Mills—
 Crown, Solid Braided White, 1 lb, 22¢
 Crown, Drab and Fancy 1 lb, 22¢
 Braided Giant, Drab and Fancy, 1 lb, 30%
 Braided, Giant, White 1 lb, 20%
 Patent, good quality 1 lb, 10¢ to 10%
 Patent Russia Sash 1 lb, 15¢ to 15%
 Samson—
 Braided d, Drab Cotton 1 lb, 24¢
 Braided d, Italian Hemp 1 lb, 40%
 Braided d, Linen 1 lb, 40%
 Braided d, White Cotton 1 lb, 37%
 Semper Idem, Braided, White 20%
 Silver Lake—
 A quality, Drab, 55¢ 25%
 A quality, White, 50¢ 25%
 B quality, Drab, 35¢ 10%
 B quality, White, 30¢ 10%
 Sylvan Spring, Extra Braided, Drab, 30%
 Sylvan Spring, Extra Braided, White, 34%

Tate's Solid Braided—
 Economy Drab 1 lb, 27%
 Economy, White 1 lb, 22%
 Hercules, Drab 1 lb, 30%
 Hercules, White 1 lb, 25%
 White Cotton Braided, fair, 1 lb, 23¢ to 24%
Wire Pictures—
 Braided or Twisted 80¢ to 80¢ to 20%
Corkscrews—See Screws, Cork.
Corn Knives and Cutters
 See Knives, Corn.
Crackers, Nut—
 Acme
 Japanned, 1/2 gro., \$30 50%
 Nickel Plated, 1/2 gro., \$30 3%
 Fancy Nickel Plated, 1/2 gro., \$30, 40%
 Table (H. & B. Mfg. Co.) 40%
 Turner & Seymour Mfg. Co. 50%
Cradles
 Grain 50¢ to 50¢ to 50¢ to 50%
Crayons—
 White Crayons, 1/2 gross 60¢ to 60%
 Cases, 100 gr., \$3.75 to \$4.25, at factory.
 D. M. Steward Mfg. Co.
 Metal Workers', 1/2 gross, \$2.50, 20¢ to 25%
 Railroad, 1/2 gross, 2.00, 20¢ to 25%
 Rolling Mill, 1/2 gross, 2.50, 20¢ to 25%
 Soapstone Pencils, 1/2 gross, 1.60, 20¢ to 25%
 See also Chalk.
Creamery Pails—See Pails, Creamery.
Crow Bars—See Bars, Crow.
Curry Combs—
 See Combs, Curry.
Cutters—Meat—
 American 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
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 No. 29 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Halters—

Covert's Adj. Rope Halters.....	40¢&25¢
Covert's Adj. Web Halters.....	35¢&25¢
Covert's Hemp Horse and Cattle Tls.....	60¢&10¢
Covert's Jute Cattle Ties.....	70¢&10¢
Covert's Jute Horse Ties.....	70¢&25¢
Covert's Rope, 7-16 in. Jute.....	70¢&25¢
Covert's Rope, 1/4 in. Hemp.....	35¢&25¢
Covert's Rope, Jute.....	60¢&10¢
Covert's Saddlery Works Hand Veb Halters.....	35¢&25¢
Covert's Saddlery Works Horse and Cattle Ties.....	35¢&25¢

Hammers—**Handled Hammers—**

Atha Tool Co.....	50¢&10¢
Buffalo Hammer Co.....	50¢&10¢
Humason & Beckley.....	50¢&10¢
Verree.....	40¢&10¢
Cheney's Chisel and Riveting.....	50¢&10¢
Cheney's Machinist's & Riveting.....	50¢&10¢
C. Hammond & Son.....	40¢&10¢
Magnetic Tack, Nos. 1, 2, 3.....	1.25, 1.50 & 1.75
Maydole's, list Dec. 1.....	25¢&10¢
Peck, Stow & Wilcox.....	40¢&10¢
Payette R. Plumb.....	40¢&10¢
Artisans' Choice, A. E. Nail.....	40¢&10¢
Engineers' and B. S. Hand.....	60¢ & 5¢
Machinist's Hammers.....	60¢&15¢
Regular Y. & P. A. E. Nail.....	40¢&10¢
Other Hammers.....	60¢&15¢
Sargent's.....	40¢&10¢
Warner & Nobles, new list.....	25¢&10¢

Heavy Hammers and Sledges—

8 lb and under.....	40¢
8 to 10 lb.....	50¢
Over 10 lb.....	60¢
Wilkinson's Smiths.....	10¢&10¢

Handcuffs and Leg Irons—

—See Police Goods.

Handles—**Cross-Cut Saw Handles—**

Atkins.....	40¢
Champion.....	45¢&45¢
Ely's Perfection.....	40¢
Sensible per doz, Fr.....	50¢, 60¢&10¢

Iron, Wrought or Cast—

Barn Door, per doz.....	1.40
Bronze Iron Drop Latches.....	20¢&5¢
Chest, Sargent's list.....	60¢&10¢
Door or Thumb.....	60¢&10¢
Nos. 1, 2, 3, 4.....	1.00, 1.25, 1.50, 1.75
Per doz.....	10.00, 12.00, 14.00, 16.00
Jap'd Store Door Handles—Nuts.....	1.10, 1.20, 1.30, 1.40
Plate, 1.10; no plate, 0.85.....	1.10, 1.20, 1.30, 1.40
Roggin's Latches.....	25¢&10¢

Wood—

Auger, assorted.....	gr 5.00
Auger, large.....	gr 7.00
File, assorted.....	gr 2.75
Brad A.W.L.....	gr 2.00
Apple Firmer Chisel, ass'd.....	gr 5.00
Apple Firmer Chisel, large.....	gr 6.00
Hickory Firmer Chisel, ass'd.....	gr 4.50
Hickory Firmer Chisel, large.....	gr 5.00
Socket Firmer Chisel, ass'd.....	gr 3.00
Socket Framing Chisel, ass'd.....	gr 5.00
Chisel, Fibre Head.....	33¢
Hammer, Hatchet, Axe, &c.....	40¢&10¢
Hoe, Rake, Shovel, &c.....	60¢&10¢
Pat. Auger, Douglass.....	set 1.25
Pat. Auger, Ives.....	30¢&10¢
Pat. Auger, Swan's.....	set 1.00
Saw and Plane.....	40¢&10¢

Hangers—

Barn Door, New England.....	70¢&70¢
Barn Door, old patterns.....	70¢&70¢
Barry.....	50¢&10¢
Best Anti-Friction.....	60¢&10¢
Best Anti-Friction.....	60¢&10¢
Best Anti-Friction.....	60¢&10¢
Carrier Steel Anti-Friction.....	60¢&10¢
Champion.....	60¢&10¢
Chicago Anti-Friction.....	60¢&10¢
Climax Anti-Friction.....	50¢&10¢
Crunk's Patent, Steel Covered.....	60¢&10¢
Duplex (Wood Track).....	60¢&10¢
Economy.....	60¢&10¢
Hamilton Wrought Steel Track.....	50¢
Interstate.....	60¢&10¢
Kidder's.....	60¢&10¢
Lane's New Standard.....	40¢&10¢
Lane's Parlor.....	40¢&10¢
Lane's Standard.....	50¢&10¢
Lundy Steel Parlor.....	40¢
Magic.....	50¢&10¢
Matchless.....	60¢&10¢
Moody.....	40¢
Moore's Bag Spring, Car Door.....	35¢&10¢
Moore's Elevator.....	35¢&10¢
Moore's Railroad.....	60¢
Nickel, Steel, Nos. 0, 25; 1, 20; 2, 15.....	40¢&10¢
Orleans Steel.....	50¢
Paragon Nos. 5, 6, 7 and 8.....	20¢&10¢
Pendulum, Payson's.....	40¢&10¢
Perfection.....	60¢&10¢
Richards.....	30¢&10¢
Samson Steel Anti-Friction.....	50¢
Star.....	40¢&10¢
Stearns' Anti-Friction.....	20¢&10¢
Stearns' Challenge.....	25¢&10¢
Sterling.....	60¢&10¢
Terry's Ideal.....	50¢&10¢
Terry's Modern.....	50¢&10¢
Terry's Shield.....	50¢&10¢
Terry's Solid.....	50¢&10¢
Terry's Wrought Single Strap.....	50¢&10¢
Victor, No. 1, 15.00; No. 2, 16.50; No. 3, 18.00.....	60¢&10¢
Warner's Pat.....	60¢&10¢
Wild West.....	60¢&10¢
Zenith for Wood Track.....	50¢

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.....	40 & 10
Blood's.....	50¢
Bun's.....	40 & 10
Hurd's.....	50¢
Mann's.....	50¢
Underhill's.....	50¢
C. Hammond & Son.....	50¢
Fayette R. Plumb.....	10¢
Collins.....	10¢
Buffalo Hammer Co.....	50 & 50
Kelly's.....	50 & 50
P. B. & W. Co.....	50 & 50
Sargent & Co.....	50 & 50
Schulte, Lohoff & Co.....	50 & 50
Ten Brook Edge Tool Co.....	50 & 50

Hay and Straw Knives

See Knives.

Hinges—**Blind Hinges—**

Clark's Nos. 1, 3, 5, 1868, Old Pattern.....	75¢&10¢
Nos. 1 and 3, Tip Pattern.....	75¢&10¢
No. 50 Buffalo Noiseless.....	40, 60 and 85
Buffalo Reversible, Nos. 3, 2, 1.....	75¢
1 and 0.....	70¢&10¢
No. 1 Cottage, for wood only.....	80¢&10¢
No. 1 Diamond, for wood only.....	80¢&10¢
Dixie L. & P., Nos. 3, 2, 1, 1, 0, 0, 0, 4 and 5.....	75¢&10¢
No. 25 Empire Reversible.....	75¢&10¢
Lull & Porter, Nos. 3, 2, 1, 1, 0, 0, 0, 4 and 5.....	75¢&10¢
Mortise Gravity, Nos. 2, 1, 4, 4, 6, 8, 9 and 10.....	50¢
Huber.....	50¢&10¢
Parker.....	75¢&10¢
Northern Automatic Blind Hinges, No. 3, for Wood, \$9.00; No. 3, for Brick, \$11.50.....	75¢&10¢
Reading's Gravity.....	75¢&10¢
Sargent's Nos. 1, 3, 5, 11, 12, 13.....	75¢&10¢
Shepard's.....	75¢&10¢
1, 0, 0, 0, 4 and 5.....	75¢&10¢
Buffalo Gravity Locking, Nos. 1, 3 and 5.....	80¢&10¢
Champion Gravity Locking, No. 75.....	80¢&10¢
Clark's or Shepard's 1868, Old Pattern, Nos. 1, 3 and 5.....	75¢&10¢
Clark's or Shepard's Tip Pattern, Nos. 1, 3 and 5.....	75¢&10¢
Double Locking, Nos. 20 and 25.....	70¢&10¢
Empire, Nos. 101 and 103.....	75¢&10¢
Niagara Gravity Locking, Nos. 1, 3 and 5.....	80¢&10¢
No. 50, 60, 65 and 55.....	75¢
O. S. Lull & Porter, Nos. 3, 2, 1, 1, 0, 0, 4 and 5.....	75¢&10¢
Pioneer, Nos. 080, 45 and 54.....	75¢
Steamboat Gravity Locking No. 10.....	80¢&10¢

Gate Hinges—

Automatic.....	per doz \$12.50, 50¢
Clark's, Nos. 1, 2, 3.....	60¢&10¢
N. E.....	per doz \$7.80, 60¢&10¢
N. E. Reversible.....	per doz \$5.60, 60¢&10¢
N. Y. State.....	per doz \$4.90, 60¢&10¢
Shepard's Nos. 1, 2, 3.....	60¢&10¢
Western.....	per doz \$4.20, 60¢&10¢

Spring Hinges—

Aome.....	30¢
American.....	20¢
Barley's Patent Chisel.....	15¢
Barker's Double Acting.....	25¢
Bommer's Japanned.....	35¢
Bommer's All other Kinds.....	30¢
Buckman's.....	15¢&20¢
Champion.....	60¢
Chicago.....	30¢
Columbia.....	per gross \$1.00
Crown.....	20¢
Devore, No. 1.....	per gross \$13.00
Freepoint.....	per gross \$12.00
Geer's Spring and Blank Butts.....	40¢
Gem.....	20¢
Idol No. 3.....	per gross \$3.00
J. G. Girdler, per gross.....	\$3.00
Knuxall.....	per gross \$12.00
New Idea No. 1.....	per gross \$10.00
New Idea No. 2.....	per gross \$18.00
New Idea Dbl. Acting.....	45¢
No. 10 Matchless.....	60¢
No. 25 Unbreakable.....	60¢
Oxford.....	20¢
Reliable.....	60¢
Rex.....	per gross \$13.00
Royal.....	60¢
Samson.....	60¢&10¢
Stearns' Noiseless Floor Hinge.....	per set \$5.00, 20¢&10¢
Union Mfg. Co.....	per gross \$12.00
Union Spring Hinge Co's list.....	March, 1886.....
Wiles' No. 1.....	per gross \$16.00, No. 2.....

Wrought Iron Hinges—

Strap and T. List May.....	60¢&10¢
22, 1894.....	00¢&10¢
Corrugated Strap and T.....	10¢&10¢
Plate Hinges, 6, 10 & 12 in.....	50¢
Providence.....	over 12 in.....
Rolled Blind Hinges, Nos. 32 and 34.....	50¢&10¢
Rolled Blind Hinges, Nos. 232 and 234.....	50¢&10¢
Rolled Plate.....	70¢&10¢
Rolled Raised.....	70¢&10¢
Screw Hook and Eye.....	1/4 in. 75¢, 1/2 in. 85¢, 3/4 in. 95¢, 1 in. 1.00
Screw Hook and.....	1/4 to 1 1/2 in. 85¢, 1 1/2 to 2 in. 95¢, 2 to 2 1/2 in. 1.00

Hoes—

Scovill and Oval Pattern.....	50¢&10¢
D. & H. Scovill.....	20¢&30¢
Grub.....	60¢&10¢
Lane's Crescent, Planters' Pattern.....	45¢&10¢
Lane's Razor Blade, Scovill Pat.....	30¢&10¢

Handled—

Garden, Mortar, &c.....	70¢&70¢
Magie.....	per doz \$4.00
Planter's Cotton, &c.....	70¢&70¢
Warren Hoe.....	80¢&10¢

Hog Rings and Rings—

See Rings and Rings.

Holisting Apparatus—

See Machines, Holisting.

Hollow-Ware—

See Ware, Hollow.

Holders—

Sensible Bag and Twine.....

Springle's Pat..... per doz \$18.00, 60¢

Bit—

Angular..... per doz \$24.00, 40¢&5¢

Extension.....

Barber's, per doz \$15.00, 40¢&10¢

Ives, per doz \$20.00, 60¢&10¢

File and Tool—

Bals Pat..... per doz \$4.00, 25¢

Nicholson File Holders..... 30¢

Sash—

Motley's Adj. Sash, Medium Size..... per doz \$1.20, 40¢

Hooks—

Bird Cage, Reading..... 60¢&10¢

Bird Cage, Sargent's List..... 60¢&10¢

Clothes Line, Sargent's List..... 50¢&10¢

Ceiling, Sargent's List..... 50¢&10¢

Clothes Line, Moore's..... 70¢

Clothes Line, Reading list..... 60¢&10¢

Coat and Hat, Moore's..... 70¢

Coat and Hat, Reading..... 50¢&10¢

Coat and Hat, Sargent's list..... 50¢&10¢

Hamcock, E. C. Stearns & Co., per doz..... 60¢

Harness, Reading list..... 55¢&10¢

Wire—

Atlas, Coat and Hat..... 33¢&4¢

Belt..... 80¢&15¢

Handy Hat and Coat..... 50¢&10¢

Indestructible Coat and Hat..... 45¢&15¢

Steady Ceiling Hooks..... 50¢&10¢

Williamson's Bird Cage Hooks, list..... 40¢

Wire Coat and Hat, Genl, list April..... 60¢&10¢

Wire Coat and Hat, Miles, list April..... 60¢&10¢

Wire Coat and Hat, Standard..... 60¢&10¢

Bright Wire Goods—See Wire.....

Wrought Iron—

Cotton..... per doz \$1.25

Cotton Pat. (N. Y. Mallet and Handle..... 30¢

Tassel and Picture T. & S. Mfg. Co..... 60¢

Wrought Staples, Hooks, &c..... See Wrought Goods

Miscellaneous—

Bush..... 55¢&60¢

Fish Hooks, American..... 50¢

Grass, No. 2, \$2.00; No. 3, \$2.10; No. 4, \$2.25

Hooks and Eyes—Brass..... 60¢&10¢

Hooks and Eyes—Malleable Iron..... 70¢&10¢

Noll's Grass..... 70¢&10¢

Whitfield Patent..... per doz \$2.25

Bench Hooks—See Bench Store..... 55¢

Horse Nails—See Nails, Horse**Horse Shoes—**

See Shoes, Horse.

Hose, Rubber—

Competition, Fair quality..... 75¢&75¢

Competition, Low Grade, 1/4 in. 54¢

Extra..... 60¢&10¢

N. Y. B. & P. Co., Carbon..... 70¢

N. Y. B. & P. Co., Double Diamond..... 60¢&10¢

N. Y. B. & P. Co., 1846 Para..... 40¢&5¢

Cotton Garden, 1/4 in. coupled..... 40¢

Fair Quality, 1/4 in. coupled..... 7¢

Good Quality, 1/4 in. coupled..... 8¢

Hooks—

Blair's Gloves, per doz, pair.....

No. 138, \$6; No. 142, \$7; No. 145, \$7;

No. 146, \$9; No. 150, \$9; No. 152, \$7.50;

No. 170, \$2.....

Blair's Pins, per gross.....

No. 100, \$7; No. 165, \$10.50.....

Best Styles A and B, \$2.40; E, \$2.10

per doz, net.....

Hubbard's Solid Steel..... per gr 4.50

Indurated Fiber Ware—

See Ware, Indurated Fiber.

Iron, Curling—

Nicol's Patent Curling Iron Heater.....

per doz.....

Shilpp's Grace Darling Curling.....

Iron, per doz.....

No. 65..... \$1.75

No. 66..... 1.50

No. 67, Mustache..... 1.25

Sad—

From 4 to 10, at factory..... per 100 lb

B. B. Sad Irons,

Plate.....45¢
Bomer's Night Latches.....15¢
R. & E. Mfg. Co., list Mar. 30, 1893.....60¢
Sargent & Co., list July, 1894.....60¢
Warner's Burglar Proof.....60¢

Elevator—

Moore's.....38¢

Padlocks—

Wrought Iron Padlocks:
Brittan, Graham & Mathes, list
Jan., 1894.....75¢
Mallory, Wheeler Co., list Jan. 1,
1894.....75¢
Norwich Lock Mfg. Co., list June
10, 1891.....60¢
Russell & Erwin Mfg. Co., list June
10, 1891.....60¢
Sargent & Co., list January 1, 1894
75¢
William Wilcox Mfg. Co., list Janu-
ary 1, 1894.....75¢
Ames Sword Co. up to No. 103 inclu.
Ames Sword Co. above No. 103.....50¢
Barnes Mfg. Co......40¢
Champion Padlocks.....40¢
A. E. Deitz.....40¢
Eagle.....40¢
Eureka, Eagle Lock Co......40¢
H. T. Fraim's Keystone Scandinavian
1010 line.....90¢
130 line.....90¢
100 line.....65¢
510 line.....70¢
255, 610 and 209 lines.....70¢
All other numbers.....70¢
Horseshoe.....50¢
Hotchkiss.....30¢
Rock's.....30¢
Bomer's No. 2 to 91.....30¢
Bomer's Scandinavian, &c., Nos. 100 to
505.....15¢
Scandinavian.....90¢
Slaymaker, Barry & Co.
No. 1010 line.....90¢
No. 41 line.....50¢
No. 61 line.....60¢
No. 21 line.....70¢
No. 109 line.....90¢
Star.....60¢
Tale Lock Mfg. Co.'s.....net prices

Sash, &c.—

Attwell Mfg. Co......25¢
Champion Safety list January, 1893.....75¢
Clark's No. 1, 210; No. 2, 38 gr......35¢
Common Sense, Jap'd, Cop'd and
Brzed.....gr \$4.00
Common Sense, Nickel Plated
gr \$3.00
Corbin's Daisy, list Feb. 15, 1893.....70¢
Davis Bronze, Barnes Mfg. Co......60¢
Ferguson's.....35¢
Fish (Liesche) Pat., No. 100, gr. 8.....50¢
No. 105, gr. 10.....50¢
Giant, list Jan. 1892.....70¢
Hammond's Window Springs.....40¢
Hugunin's New Sash Locks.....25¢
Hugunin's Sash Balances.....25¢
Ives' Patent.....60¢
Kempshall's Gravity.....60¢
Kempshall's Model.....60¢
Monarch.....50¢
Payson's Perfect.....60¢
Reading.....60¢
Security.....70¢
Universal.....30¢
Victor.....60¢
Walker's.....10¢
Wolcott's.....60¢

Lumber Tools—

See Tools, Lumber.
Lustro
cut-ounce bottles.....dos, \$1.75; gr
gross.....\$17.00

Machines.

Boring—

Without
Angers, Upright, Angular.
Boss, Carpenters' 3.50
Boss, Ship Bldrs' 3.75
Douglas.....\$5.50 \$6.75.....50¢
Jennings.....5.50 6.75.....50¢
Millers Falls.....7.50.....25¢
Phillips' Patent
with Anger.....7.00 7.50.....25¢
Snell's, Rice's Pat. 5.50 6.75.....40¢

Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
\$4.50 each.....35¢
Combined Fluter and Sash Iron
gr \$15.00.....30¢
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,
\$6.50 each.....35¢
Crown Hand Fluter, Nos. 1, \$15.00; 2,
\$12.50; 3, \$10.00; 4, \$8.25.....30¢
Crown Jewel 6 in......\$3.50 each, 35¢
Domestic Fluter.....each, \$1.50
Eagle, 8 1/2-inch Rolls, \$2.15.....35¢
Eagle, 6 1/2-inch Rolls, \$2.25.....35¢
Knox, 4 1/2-inch Rolls.....\$3.25 each, 35¢
Knox, 6-inch Rolls.....\$3.60 each, 35¢

Holisting—

Moore's Anti-Friction Differential Pul-
ley Block.....20¢
Moore's Hand Holist, with Lock Brake.....20¢
Moore's Rope Differential Pulley
Block.....80¢
Morris & Beekley (Teal Patent).....30¢
See also Blocks.

Washing—

Fair and Square.....dos \$42.00
Anthony Wayne.....dos, No. 1, \$42; No. 2, \$36; No. 3, \$42
Wayne American.....dos \$38.00
Wells.....dos \$36.00
Western Star.....dos, No. 2, \$36 No. 3, \$39

Mallets—

B. & L. Block Co., Hickory & L. V.
80¢.....40¢
Wire Head, Stearns.....33¢
Hickory.....20¢
Wigmurites.....20¢

Mattocks—

Regular list.....60¢

Measures—

Standard Fibreware, No. 1, peck
dosen, \$3.50; 1/2-peck, \$3.00

Meat Cutters—

See Cutters, Meat.

Menders—

Harness.....\$ doz., \$1.75
Hudson's Hose Menders, in set.....\$ doz., \$3.00

Hudson's Hose Bands.....gr. \$1.25

Milk Cans—See Cans, Milk.

Mills—

Box and Side, list Jan. 1, 1893.....60¢

American, Enterprise Mfg. Co., list Jan.
17, 1893.....20¢

National List, Jan. 1, 1894.....30¢

Swift, Lane Bros......30¢

Waddell's New Box Mills, Ideal
Brand, New List.....60¢

Mincing Knives—
See Knives, Mincing.

Molasses Gates—
See Gates, Molasses.

Money Drawers—
See Drawers, Money.

Mowers, Lawn—
10 in. 12 in. 14 in.

Best.....\$4.00 \$5.25 \$4.50 \$6.00 \$5.00 \$6.75

Good.....\$3.00 \$3.25 \$3.50

Cheapest.....2.25 2.50 2.75

Muzzles—
Safety.....dos, \$3.00, 25¢

Nails—

Cut and Wire. See Trade Report.

Wire Nails, Papered.
Association list, May 1, '92.....85¢

Hungarian, Finishing, Upholsterers', &c.
See Tacks.

Horse—

Nos. 6 7 8 9 10

A. C......25¢ 23¢ 22¢ 21¢ 20¢

American.....9¢ 9¢ 9¢ 9¢ 9¢

Anchor.....23¢ 21¢ 20¢ 19¢ 18¢

Ansable.....23¢ 21¢ 20¢ 19¢ 18¢

Capewell.....19¢ 18¢ 17¢ 16¢ 15¢

C. B. K......25¢ 23¢ 22¢ 21¢ 20¢

Champion.....25¢ 23¢ 22¢ 21¢ 20¢

Champlain.....25¢ 23¢ 22¢ 21¢ 20¢

Clinton, Fin......19¢ 17¢ 16¢ 15¢ 14¢

Empire Bronzed.....11¢

Essex.....23¢ 21¢ 20¢ 19¢ 18¢

Lyra.....9¢ 9¢ 9¢ 9¢ 9¢

Maud S......25¢ 23¢ 22¢ 21¢ 20¢

Northwest'n......25¢ 23¢ 22¢ 21¢ 20¢

Putnam.....23¢ 21¢ 20¢ 19¢ 18¢

Snowden.....23¢ 21¢ 20¢ 19¢ 18¢

Standard.....23¢ 21¢ 20¢ 19¢ 18¢

Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢

Western.....23¢ 21¢ 20¢ 19¢ 18¢

Picture—
Brass Head, Combination list.....50¢

Brass Head, Sargent's list.....60¢

Porcelain Head, Combination list.....40¢

Porcelain Head, Sargent's list.....50¢

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nippers—See Pliers and Nippers

Nut Crackers—
See Crackers, Nut.

Nuts—List Dec. 18, 1893.
Square, Hex.

Cold Punched.....5¢ 5¢ off list

Hot Pressed.....5¢ 5¢ off list

In packages of 100 lb, add 1-10¢ lb, add
1/2¢ lb, net.

Oakum—

Best or Government.....\$ 6 @ 6¢

Navy.....\$ 5 @ 5¢

U. S. Navy.....\$ 6 @ 6¢

Oil Tanks—See Tanks, Oil.

Olives—

Brass and Copper.....50¢

Zinc and Tin.....50¢

Broughton's Brass.....70¢

Broughton's Zinc.....60¢

Malleable, Hammers' Improved, No. 1,
\$3.60; No. 2, \$4.00; No. 3, \$4.40.....dos.

Malleable, Hammers' Old Pattern, same
size.....10¢

Oliver's Brass and Copper.....50¢

Oliver's Tin and Zinc.....60¢

Prior's Pat. or "Paragon" Brass.....60¢

Prior's Pat. or "Paragon" Zinc.....60¢

Steel, Draper & Williams.....50¢

Wilmot & Hobbs Mfg. Co., Steel Anti-
Scorer's.....60¢

Openers, Can—
American, gross \$1.75 @ \$2.00

Champion.....dos \$2.00.....50¢

Domestic.....dos \$2.00.....45¢

Duplex.....dos \$2.50, 15¢ 20¢

Eureka.....dos \$2.50, 15¢ 20¢

Excelsior, No. 1, \$2.50; No. 2, \$1.50.....40¢

French, No. 4.....dos \$2.25, 65¢ 80¢

Iron Handle, No. 5.....gr \$3.00, 45¢ 60¢

Lyman's.....dos \$3.75, 20¢

Messenger's Comet.....dos \$3.00, 25¢

Moore's.....dos \$2.75, 65¢ 75¢

Sardine Scissors.....dos \$2.75, 65¢ 75¢

Sprague, No. 1, 55¢; 2, 60¢; 3, 65¢
Star.....dos \$2.75

Sensible, Janned, per doz......60¢

Sensible, Nickel, per doz......75¢

Surprise, per doz......25¢

New Sprague, Metal H'dle, per doz......60¢

New Sprague, Wood H'dle, per doz......60¢

Universal.....dos \$3.00.....55¢

World's Best.....gr \$3.00, 1, \$12.00
No. 2, \$24.00; No. 3, \$36.00.....50¢

Packing, Steam—
Rubber—
Standard, fair quality.....70¢

Extra.....60¢

Jenkins' Standard.....\$ 80¢

N. Y. B. & P. Co., Double Diamond.....60¢

N. Y. B. & P. Co., Salamander.....45¢

N. Y. B. & P. Co., Carbon.....70¢

Miscellaneous—
American Packing.....\$ 10¢

Cotton Packing.....\$ 10¢

Italian Packing.....\$ 10¢

Jute.....\$ 10¢

Russia Packing.....\$ 10¢

Pails—

S. S. & Co., 13-qt., \$7.00; 20-qt., \$7.25
\$ doz......5¢

Galvanized Pails—

Light.....Heavy

10 Quart.....\$2.00 \$2.25 \$2.50 \$2.75

12 Quart.....2.25 2.50 2.75 3.00

14 Quart.....2.50 2.75 3.00 3.25

Galvanized Buckets—
Fire.....Well

10 Quart.....\$2.50 \$2.75 \$3.00 \$3.25

12 Quart.....2.75 3.00 3.25 3.50

14 Quart.....3.00 3.25 3.50 3.75

Indurated Fiber Ware
Fire Pails, deep.....dos \$4.30

Fire Pails, round bottom.....dos \$5.40

Milk, 14 qt......dos \$5.40

Stable, 14 qt......dos \$6.00

Star Pails, 12 qt......dos \$4.20

Standard Fiber Ware—
Buggy Pails.....Plain, Dec'd

Chamber Pails, 14 qt......\$3.00 \$7.00

Dairy Pail, 14 qt., \$ doz......3.75 4.25

Fire Pails, No. 1, 12 qt., \$ doz......3.75

Fire Pails, No. 2, 14 qt., \$ doz......4.25

Horse Pails.....4.00

Stop Jars (Gal. trap).....7.50 8.50

Sugar Pails.....4.75 5.25

Water Pails, 12 qt., \$ doz......3.00 3.75

Pans—Dripping—
Large sizes.....\$ 5¢

Small sizes.....\$ 5¢

Silver & Co. (Covered).....40¢

Fry—
Standard List
No. 1.....1 2 3 4

No. 2.....\$5.00 \$5.75 \$4.25 \$4.75

No. 3.....\$6.00 \$7.00 \$5.00 \$5.50

Polished, regular goods.....75¢

Acme Fry Pans.....60¢

Steel Edge, No. 1.....dos \$1.75

Roasting and Baking—
Columbian, S. S. & Co., Nos. 10, \$2; 20,
\$2.25; 30, \$2.50 each.....60¢

Paper and Cloth—
Sand and Emery
list April 10, 1886.....50¢

Sibley's Emery and Crocus Cloth.....30¢

Parers—
Apple—
Advance.....dos \$4.50

Baldwin.....dos 5.00

Bonanza.....each 5.00

Daisy.....dos 5.50

Dandy.....each 7.50

Eclipse.....dos 4.00

Eureka, 1888.....each 10.00

Family Bay State.....dos 12.00

Pullers Nail-

Bellevue..... 50¢ doz, \$24.00, 40¢
 Economy..... 50¢ doz, \$5.50 to \$6.00
 Ellrich..... 50¢ doz, \$10.00
 Giant, No. 1..... 50¢ doz, \$18.00, 10¢ doz
 Giant, No. 2..... 50¢ doz, \$15.00, 10¢ doz
 Pelican..... 50¢ doz, \$9.00, 25¢ doz
 Seranton..... 50¢ doz, \$18.00, 33¢ doz, 33¢ doz

Pulleys-

Brass Screw..... 70¢
 Hay Fork, "Anti-Friction," 5 in. solid..... 50¢
 Hay Fork, "F" Common and Patent..... 20¢
 Hay Fork, Moore's Anti-Friction 5 in. Wheel, 50¢ doz, \$12.00, 40¢
 Hay Fork, Reed, Self-Lubricating..... 40¢
 Hay Fork, Solid Eye, 50¢ doz, \$12.00, 40¢
 Hay Fork, Stearns' Nos. 35 & 45, 60¢ doz
 Hay Fork, Stearns' Nos. 15, 25, 50, 60, 60¢
 Hay Fork, Tarnox Pat. Iron..... 20¢
 Hay Fork, Side, Anti-Friction..... 20¢
 Japanned Cloth Line..... 60¢ doz, 10¢ doz
 Japanned Screw..... 70¢ doz, 10¢ doz
 Japanned Side..... 70¢ doz, 10¢ doz
 Moore's Ceiling or End, Anti-Friction..... 40¢
 Moore's Dumb Walter, Anti-Friction..... 40¢
 Moore's Electric Light..... 30¢
 Moore's Side, Anti-Friction..... 20¢
 Sash (Auger Mortise). On bol. loks ex. 5¢
 Common Sense..... 60¢
 Empire..... 60¢
 Acme..... 60¢
 Ideal, Nos. 2, 4, 10 & 15..... 60¢ less 1¢
 Star..... 60¢
 Ideal, or IX, No. 60..... 60¢ doz net.
 Made Rack..... 45¢
 Shepard's Niagara, No. 25..... 60¢ doz net.
 Tackle Blocks-See Blocks.

Pumps-

Clifton, Best Makers..... 60¢ doz, 10¢ doz
 Pitcher Spout, Best Makers..... 70¢ doz, 10¢ doz
 Pitcher Spout, Cheaper G'ds..... 75¢ doz, 80¢
 Myers' Pumps, low list..... 50¢
 Detroit Valve & Washer Co.'s Pump..... 60¢
 Leathers..... 60¢ doz

Punches-

Avery's Revolving Punch-See Sawsets
 Bemis & Call Co.'s Cast Steel Drive..... 50¢
 Bemis & Call Co.'s Check..... 50¢
 Bemis & Call Co.'s Spring..... 50¢
 Bemis & Call Co.'s Springfield Socket..... 50¢
 Niagara Hollow Punches..... 20¢
 Niagara Solid Punches..... 20¢
 Kice Hand Punches..... 15¢
 Saddle's or Drive, good..... 60¢ doz, 60¢
 Spring, good quality..... 60¢ doz, 60¢
 Spring, Leach's Pat..... 15¢
 Solid Timmers, P., S. & W. Co., 60¢ doz
 Timmers' Hollow Punches, P., S. & W. Co., 60¢ doz

Rail-

Barn Door, Light, In. 3/4 3/4 3/4
 Per 100 ft. net..... \$1.75 2.10 2.75
 B.D. for N. E. Hand..... Small, Med. Large.
 Per 100 feet..... \$2.00 2.50 3.00 Net
 Carrier, double braced, Steel Rail, 3/4 foot..... 3/4
 Lundy Parlor Door, Planed Edge, 3/4 ft. 7/8
 Moody Steel Rail..... 45¢
 Moore's Steel Rail..... 35¢
 Sliding Door, Bronze Wrt Iron, 3/4 ft. 3/4
 Sliding Door, Iron, Painted..... 3/4 ft. 3/4
 Sliding Door, Wrt Brass, 3/4 ft. 3/4, 40¢
 Terry's Steel Rail..... 3/4 ft. 4¢
 Victor Track Rail, 7/8 ft. foot..... 50¢ doz, 10¢

Rakes-

Cast Steel, Association G'ds..... 70¢ doz, 85¢ doz
 Cast Steel, outside goods..... 70¢ doz, 85¢ doz
 Malleable, good..... 70¢ doz, 85¢ doz
 Malleable, low grade..... 70¢ doz, 85¢ doz
 Fort Madison Rake, No. 1..... 65¢
 Peerless..... 65¢
 Fort Madison Steel Tooth Lawn Rake, 60¢
 Gibbs..... 60¢
 Gibbs' Acme Lawn Rake..... 60¢, \$4.00
 Gibbs' Crown Lawn Rake..... 60¢, \$4.75
 Gibbs' Canton Lawn Rake, No. 1..... 60¢, \$4.00
 Gibbs' Favorite Lawn Rake..... 60¢, \$3.00
 Gibbs' Hustler No. 0..... 60¢, \$4.25
 Gibbs' Hustler No. 1..... 60¢, \$4.40
 Oneida Lawn Rake..... 60¢, \$6.00

Razors-

Campbell Cutlery Co..... 50¢
 Electric Cutlery Co..... Net prices
 Galvanic..... 50¢, \$15.00
 Jordan's & Co., new list..... Net prices
 Jordan's Old Razor, new list..... Net prices
 J. R. Torrey Razor Co..... Net prices
 Wootenholm and Butcher, \$10 to 2..... 10¢

Razor Straps-

See Straps, Razor.

Reels-

Clothes Line..... 33¢ doz, 10¢

Fishing-

Hendryx Aluminum, German Silver, Gold, Bronze, Silver Rubber, Popolo and Salmon, Single Action, Multiplying and Quadruple, all sizes..... 25¢
 Hendryx Single Action Series 102P and PN, 202P and PN, 102PR and PN, 202PR and PN, 304P and PN, 304PR and PN, 502 and 502N, 802 and 802N, 02084N, Competitor..... 50¢
 Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2004N and PN, 20084N and PN, 0224 and 0224N, 5000N and PN..... 40¢ doz

Registers-

Moore's Bronze Registers..... 75¢
 Moore's Electroplated..... 80¢
 Moore's Japanned..... 80¢
 Moore's Solid Bronze..... 70¢
 Moore's Stove Pipe..... 85¢

Rings and Ringers-

Bull Rings..... 40¢
 Hotchkiss' low list..... 40¢
 Humason, Beckley & Co.'s..... 75¢
 Peck, Stow & W. Co.'s..... 80¢ doz, 10¢
 Sargent's..... 80¢ doz, 10¢

Hog Rings and Ringers-

Note.-The market on Hog Rings and Ringers is in a demoralized condition and prices are low and irregular. We therefore withdraw quotations for the present.

Rivets and Burrs-

Copper..... 50¢ doz, 10¢
 Coppered Iron, Best Brand..... 50¢ doz
 Iron Norway, list Nov. 17 '87..... 65¢ doz
 Second Quality..... 70¢ doz, 10¢

Rivet Sets-See Sets.**Roasting and Baking Pans-See Pans, Roasting and Baking.****Rods-**

Stair, Black Walnut..... 50¢ doz, 40¢
 Stair, Brass..... 25¢ doz, 30¢

Rollers-

Acme Moore's Anti-Friction..... 50¢ doz, 10¢
 Barn Door, Sargent's list..... 60¢ doz, 10¢
 Moore's Barn Door Stay..... 60¢
 Union Barn Door Roller..... 70¢
 Thompson Mfr. Co.'s Lawn Rollers..... 30¢

Rope-

The following prices are f.o.b. New York or factory, and are shaded 1/4¢ per lb. on large lots; terms, 1 1/2% for cash.
 Manila, 7-16 in. diam. and larger..... 8¢ doz, 8 1/4¢
 Manila, 3/4 in. to 1 in. diam..... 8 1/4¢ doz, 8 3/4¢
 Manila, 1 1/4 in. to 1 1/2 in. diam..... 8 3/4¢ doz, 9¢
 Manila, Tanned Rope, Med'm..... 8¢ doz, 8 1/4¢
 Manila, Hay Rope, Med'm..... 8¢ doz, 8 1/4¢
 Sisal, 7-16 in. and larger..... 5¢ doz, 5 1/4¢
 Sisal, 3/4 in. to 1 in. diam..... 5 1/4¢ doz, 5 3/4¢
 Sisal, Hay Rope..... 5¢ doz, 5 1/4¢
 Sisal, Tanned Rope..... 5¢ doz, 5 1/4¢
 Sisal, Medium Lath Yarn..... 5¢ doz, 5 1/4¢
 New Zealand..... 5¢ doz, 5 1/4¢
 New Zealand, 3/4 in. to 1 in. diam..... 5 1/4¢ doz, 5 3/4¢
 New Zealand, 1 1/4 in. to 1 1/2 in. diam..... 5 3/4¢ doz, 6¢
 New Zealand, Hay Rope..... 5¢ doz, 5 1/4¢
 Sisal, Tanned Rope..... 5¢ doz, 5 1/4¢
 Cotton Rope..... 12¢ doz, 15¢
 Jute Rope..... 12¢ doz, 15¢

Wire Rope-

List Sept. 1, 1894. All kinds..... 20¢ doz, 2 1/2¢, cash

Rules-

Boxwood..... 50¢ doz, 10¢ doz, 10¢ doz, 10¢
 Ivory..... 50¢ doz, 10¢ doz, 10¢ doz, 10¢
 Starrett's Steel Rules and Straight Edges..... 25¢ doz, 10¢

Sad Irons-See Irons, Sad.**Sand and Emery Paper and Cloth-**

See Paper and Cloth.

Sash Cord-See Cord, Sash.**Sash Locks-See Locks, Sash.****Sash Weights-**

See Weights, Sash.

Sausage Stuffers or Fillers-See Stuffers or Fillers, Sausage.**Saws-**

Note.-Extra 5¢ doz, 10¢ often given.

Atkins' Circular..... 50¢ doz, 10¢
 Atkins' Band..... 50¢ doz, 10¢
 Atkins' Cross Cuts, new list..... 40¢
 Atkins' Mulay, Mill and Drag..... 50¢ doz, 10¢
 Atkins' One-Man Saw..... 40¢
 Atkins' Wood Saws..... 40¢
 Atkins' Wood Compass, etc..... 40¢
 Atkins' Circular..... 45¢ doz, 10¢
 Diston's Cross Cut, list Jan. 1, '93, 40¢ doz, 10¢
 Diston's Hand..... 25¢
 O. E. Jennings & Co.'s..... 25¢
 Peace Circular and Mill..... 45¢ doz, 10¢
 Peace Cross Cuts, list Jan. 1, '93..... 45¢ doz, 10¢
 Peace Hand, Panel and Rip..... 45¢ doz, 10¢
 Richardson's Circular and Mill..... 45¢ doz, 10¢
 Richardson's X Cuts, list Jan. 1, '93, 45¢ doz, 10¢
 Richardson's Hand, etc..... 25¢ doz, 10¢
 Simonds' Circular Saws..... 45¢ doz, 10¢
 Simonds' Crescent Ground Cross Cut Saws..... 45¢ doz, 10¢
 Simonds' One-Man Cross Cuts..... 45¢ doz, 10¢
 Simonds' Gang, Mill, Mulay and Drag Saws..... 45¢ doz, 10¢
 Wheeler, Madden & Clemson Mfg. Co. Cross Cuts, list Jan. 1, 1893..... 45¢ doz, 10¢
 Hand, Panel and Rip..... 45¢ doz, 10¢
 Woodrough & McParlin..... 45¢ doz, 10¢
 Cross Cuts, list Jan. 1, 1893..... 45¢ doz, 10¢
 Hand, Panel and Rip..... 45¢ doz, 10¢

Hack Saws-

Eureka and Crescent..... 25¢
 Griffith's complete..... 40¢ doz, 10¢
 Griffith's Hack Saw Blades..... 40¢ doz, 10¢
 Star Hack Saws and Blades..... 25¢

Scrolls-

Barnes' No. 1, \$3; No. 8, \$10; No. 7, \$15.25¢
 Barnes' Scroll Saw Blades..... 35¢
 Lester, complete, \$10.00..... 25¢
 Rogers, complete, \$4.00..... 25¢

Saw Frames-

See Frames, Saw.

Saw Sets-See Sets, Saw.**Saw Tools-See Tools, Saw.****Scale Beams-**

See Beams, Scale.

Scales-

Chattillon's Favorite..... 25¢
 Chattillon's Favorite..... 40¢
 Chattillon's Grocers' Trip Scales..... 50¢
 Family, Turnbills..... 30¢ doz, 10¢
 Hatch, Counter, No. 171, good quality..... 50¢
 Hatch Tea, No. 161..... 50¢ doz, 10¢
 Riehle Bros' Platform..... 40¢ doz, 10¢
 Benson's Platform..... 40¢ doz, 10¢
 Union Platform, Striped..... 25¢ doz, 10¢
 Standard..... 50¢

Scissors, Fluting-

Adjustable Box Scraper (S. R. & L. Co.)..... 40¢ doz, 10¢

Scraper-

Box 1 Handle..... 40¢ doz, 10¢
 Box 2 Handle..... 40¢ doz, 10¢
 Deance Box and Ship..... 40¢ doz, 10¢
 Foot..... 40¢ doz, 10¢
 Ship, Common..... 40¢ doz, 10¢
 Ship, R. J. Tool Co..... 40¢ doz, 10¢
 Tatum's Box..... 40¢ doz, 10¢

Screen Window and Door Frames-See Frames.**Screw Drivers-**

See Drivers, Screw.

Screws-

Bench, Iron..... 55¢ doz, 10¢
 Bench, Wood, Hickory..... 50¢ doz, 10¢
 Bench, Wood, Hickory..... 50¢ doz, 10¢
 Hand, Wood..... 25¢ doz, 10¢
 Hand, Grand Rapids, list..... 35¢

Coach, Lag and Hand-Rail-

Lag, Blunt Point, list Jan. 1, 1890..... 85¢ doz, 10¢
 Coach and Lag, Gunlet Point, list Jan. 1, 1890..... 80¢ doz, 10¢
 Hand Rail, Am. Screw Co..... 80¢
 Hand Rail, H. & B. Mfg. Co..... 75¢ doz, 10¢
 Hand Rail, Sargent's..... 70¢ doz, 10¢

Jack Screws-

Millers Falls..... 50¢ doz, 10¢
 Millers Falls, Koller..... 50¢ doz, 10¢
 P. S. W..... 35¢
 Sargent..... 70¢ doz, 10¢
 Stearns..... 40¢ doz, 10¢
 Tatum's..... 25¢ doz, 10¢

Cork-

Detroit Cork Screw Co..... 35¢
 Humason & Beckley Mfg. Co..... 40¢ doz, 10¢
 William's Forged Worm Applewood Handle, 50¢ doz, \$5.00; Rosewood, \$5.50..... 40¢

Machine-

List August 1, 1894.
 Flat Head Iron..... 45¢
 Round Head Iron..... 40¢

Wood-

List January 1, 1891.
 Flat Head Iron..... 85¢
 Round Head Iron..... 75¢
 Flat Head Brass..... 85¢
 Round Head Brass..... 75¢
 Flat Head Bronze..... 80¢
 Round Head, Bronze..... 75¢
 Rogers' Drive Screws..... 87¢ doz, 10¢

Scroll Saws-See Saws, Scroll.**Scythes-**

Grain..... 40¢ doz, 10¢
 Grass..... 40¢ doz, 10¢

Scythe Snaths-See Snaths, Scythe.**Sets-**

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